SUPPLEMENT.

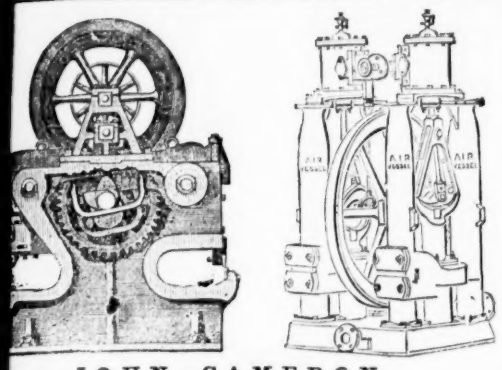
The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[*The* MINING JOURNAL *is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.*]

1998.—VOL. XLIII. LONDON, SATURDAY, DECEMBER 6, 1873. PRICE.....FIVEPENCE. PER ANNUM, BY POST, £1 4s.

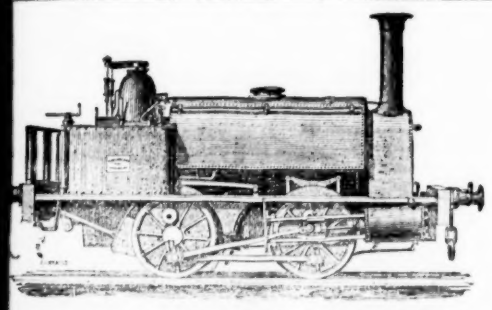


JOHN CAMERON,

MAKER OF

M PUMPS, PORTABLE ENGINES, PLATE BENDING ROLLERS
R AND ANGLE IRON SHEARS, PUNCHING AND SHEARING MACHINES, PATENTEE OF THE DOUBLE CAM LEVER PUNCHING MACHINE, BAR SHEARS, AND RAIL PUNCHING MACHINES,

ERTON STREET IRON WORKS,
HULME, MANCHESTER.



TANK LOCOMOTIVES,

FOR SALE OR HIRE.

NRY HUGHES AND CO.
LOUGHBOROUGH.

XFORD'S PATENT SAFETY FUSE,
FOR CONVEYING FIRE TO THE
CHARGE IN BLASTING ROCKS, &c.

ed the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1851; at NTERNATIONAL EXHIBITION" of 1862, in London; at the "IMPERIAL SITION," held in Paris, in 1855; at the "INTERNATIONAL EXHIBI-" in Dublin, 1865; at the "UNIVERSAL EXPOSITION," in Paris, 1867; "GREAT INDUSTRIAL EXHIBITION," at Altona, in 1869; and at the VERSAL EXHIBITION," Vienna, in 1873.

BICKFORD, SMITH, AND CO., of TUCKINGMILL, CORNWALL, MANUFACTURERS AND ORIGINAL PATENTEES of SAFETY-FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—

RY COIL of FUSE MANUFACTURED by them has TWO SEPARATE ADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICK-, SMITH, AND CO. CLAIM TWO SUCH SEPARATE THREADS as R TRADE MARK.

For Excellence of Engines / Practical Success / Represented by Model exhibited by this Firm.

HARVEY AND CO.,

NGINEERS AND GENERAL MERCHANTS,
HAYLE, CORNWALL,
HAYLE FOUNDRY WHARF, NINE ELMS, LONDON,
AND 120, GRESHAM HOUSE, E.C.

MANUFACTURERS OF

MPING and other LAND ENGINES and MARINE STEAM ENGINES e largest kind in use, SUGAR MACHINERY, MILLWORK, MINING ACHINERY, and MACHINERY IN GENERAL.
SHIPBUILDERS IN WOOD AND IRON.

SECONDHAND MINING MACHINERY FOR SALE.

IN FIRST-RATE CONDITION, AT MODERATE PRICES.

PING ENGINES; WINDING ENGINES; STAMPING ENGINES; TEAM CAPSTANS; and CRUSHERS of various sizes. BOILERS, PIT-ORK of all descriptions, and all kinds of MATERIALS required for INING PURPOSES.

THE PATENT PNEUMATIC STAMPS
be SEEN AT WORK at HAYLE FOUNDRY WHARF, NINE ELMS, by previous application at either of the above addresses.

CAPTAIN TREGAY'S
IMPROVED PATENT
TAMP COFFER,

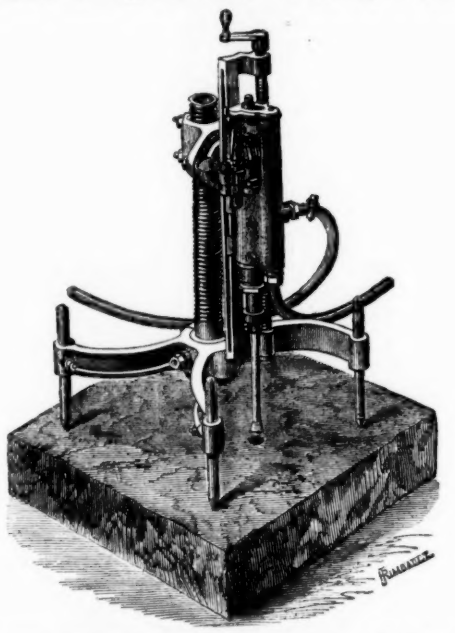
FOR STAMPING GOLD QUARTZ, TIN, AND OTHER ORES.
rateway is extended, discharge doubly increased, and power economised.
be inspected in full work, on pplication to Captain TREGAY, Redruth, all, who is PREPARED to TREAT for GRANTING LICENSES r its use, UPPLY the MACHINES.

PARIS. ORDER OF THE CROWN OF PRUSSIA. FALMOUTH.

McKEAN'S ROCK DRILL,

WITH SPECIAL ADAPTATIONS FOR MINE LEVELS, RAILWAY TUNNELS, QUARRIES, AND SUBMARINE WORK,
500 *TO* 1000 *STROKES PER MINUTE*,
PENETRATES GRANITE 6 TO 12 INCHES PER MINUTE.
MACHINES WARRANTED.

In use at the ST. GOTHARD TUNNEL, ST. JOHN DEL REY MINES, and at various Tunnel, Mining, Harbour, and Quarry Works.



McKEAN'S ROCK DRILL has the following ADVANTAGES over ALL other MACHINES, viz.:—

1.—It is the simplest in construction, and contains the fewest parts.
2.—No duplicate parts whatever require to be furnished with machines.
3.—Greater durability, on account of its superior mechanical construction.
4.—It is the most powerful, and runs at greater speed than any other, without liability to derangement or breakage.
5.—Greater facility of manipulation in its adaptation to various kinds of work.

Manufactured for McKean and Co. by
MESSRS. P. AND W. MACLELLAN, "CLUTHA IRONWORKS," GLASGOW;
MESSRS. VARRALL, ELWELL, AND MIDDLETON, AND MESSRS. SAUTTER, LEMONNIER, AND CO., PARIS;
AND E. REMINGTON AND SONS, NEW YORK.

PORTABLE BOILERS, AIR COMPRESSORS, "SPECIAL ROCK DRILL STEEL," and a superior quality of FLEXIBLE STEAM TUBING furnished at lowest rates.

McKEAN AND CO.,

ENGINEERS.

OFFICES.

32, LOMBARD STREET, LONDON, E.C.; and 5, RUE SCRIBE, PARIS.

WORKS AND DEPOT.

42 and 43, BOROUGH ROAD, S.E., LONDON.

Circulars sent free.

One of McKEAN'S ROCK DRILLS may be seen working in Aberdeen granite from One to Four o'clock daily at 42, Borough-road, S.E., London.

THE SANKEY WHITE LEAD COMPANY
(LIMITED),
WARRINGTON.

TRADE MARK.

Manufacturers of PURE CARBONATE OF LEAD

JOHN BOURNE AND CO.,

ENGINEERS, SHIPBUILDERS, AND CONTRACTORS,
66, MARK LANE, LONDON.

COMPOUND WINDING ENGINES,

Inexpensive, easily handled, and very economical in fuel.

COMPOUND ENGINES FOR ROLLING MILLS,

Without gearing and fly-wheel, and wholly exempt from break downs.
Pumping Engines, Blowing Engines, Steam Boilers, Hydraulic Machinery, Coal Washing Machines, Shearing Machines, Cranes, and all kinds of Apparatus required in Collieries and Ironworks.

SOLID DRAWN BRASS BOILER TUBES,

FOR LOCOMOTIVE AND MARINE BOILERS,
EITHER
MUNTZ'S OR GREEN'S PROCESS.
MUNTZ'S METAL COMPANY (LIMITED),
FRENCH WALLS,
NEAR BIRMINGHAM.

MINERS'
PRICKERS AND STEMMERS
OF
MUNTZ'S METAL.
ACCORDING TO THE NEW MINES REGULATION ACT.
BEST KNOWN MATERIAL.
MUNTZ'S METAL COMPANY (LIMITED),
FRENCH WALLS,
NEAR BIRMINGHAM.

TO MINE PROPRIETORS, COLLIERY OWNERS, SINKERS, QUARRYMEN, RAILWAY, AND OTHER CONTRACTORS.

DYNAMITE.

THE BRITISH DYNAMITE COMPANY (LIMITED), the Sole Proprietors of NOBEL'S BRITISH PATENTS for DYNAMITE or SAFETY BLASTING POWDER, has APPOINTED JOHNSON AND CO., TRINDLE ROAD, DUDLEY, their DISTRICT AGENTS for North and South Staffordshire, East Worcestershire, Shropshire, Derbyshire, Warwickshire, Leicestershire, Nottinghamshire, and Cannock Chase Districts.
PRICES AND TERMS ON APPLICATION.

WILTON'S MATHEMATICAL INSTRUMENT ESTABLISHMENT, REMOVED from St. Day to A. JEFFERY'S, CAMBORNE.

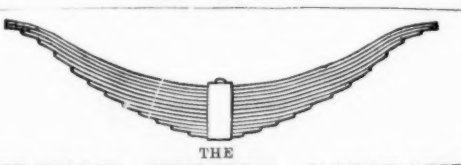
W. H. WILTON begs to thank his friends for their liberal support for so many years, and informs them that (having opened business at Valparaiso) he has now declined business in England in favour solely of Mr. A. JEFFERY, MATHEMATICAL INSTRUMENT MAKER, CAMBORNE, whom he considers (having been an assistant to his father for several years) is in every way capable of creditably maintaining the good name universally awarded to Wilton's instruments.

A. JEFFERY

Respectfully begs to inform Mine Managers, Surveyors, Engineers, &c., that having purchased Mr. Wilton's business, and the very valuable acquisitions and appliances belonging thereto, he has enlarged his Mathematical Instrument Manufactory, and is prepared to supply THEODOLITES, DIALS, POCKET DIALS, LEVELS, TRAVERSING and PLAIN PROTRACTORS, CASES OF DRAWING INSTRUMENTS, MEASURING CHAINS and TAPES, ASSAYERS' SCALES and WEIGHTS, ENGINE COUNTERS, and, in short, every description of Instruments used in SURVEYING, MEASURING, MAPPING, &c.
Repairing in all its branches promptly attended to.

GIRDWOOD'S
PATENT RECIPROCATING CRUSHER

Is the SIMPLEST and BEST PULVERISER in existence. It will do BETTER WORK, and MORE OF IT, on same power than any other yet invented.
Apply for terms to GEORGE GREEN, Aberystwith; or to the patentee, ROBERT GIRDWOOD, Edinburgh.
MAY BE SEEN AT WORK AT GREAT DARRENMINE, NEAR ABERYSTWITH.



THE
RAILWAY SPRING COMPANY,
MILLSANDS, SHEFFIELD,
MANUFACTURERS OF EVERY DESCRIPTION OF
RAILWAY SPRINGS.

HEPBURNS'
PUMP LEATHER
WATERPROOF

By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

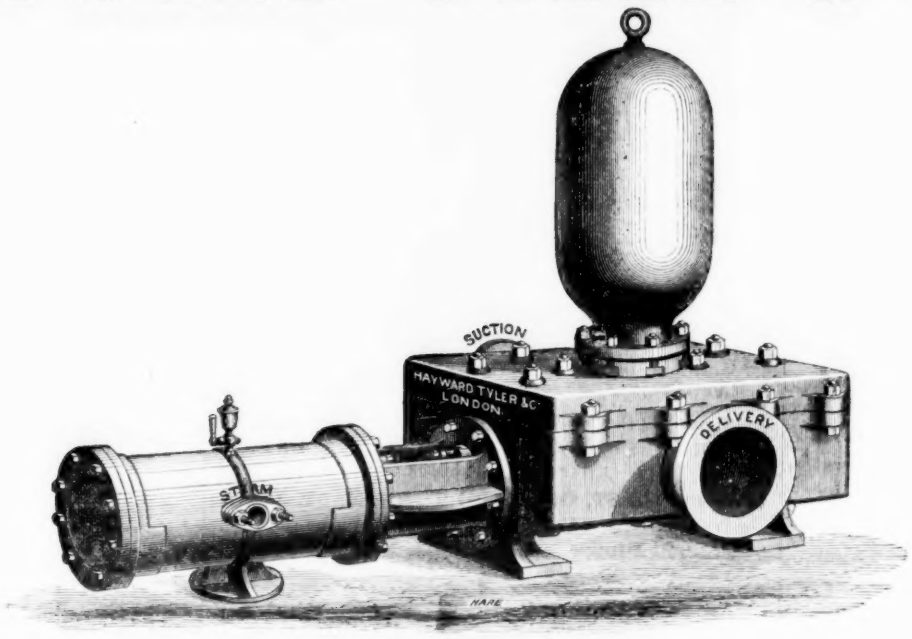
I. AND T. HEPBURN AND SONS,
TANNERS AND CURRIERS, LEATHER MILLBAND AND HOSE PIPE MANUFACTURERS,
LONG LANE, SOUTHWARK, LONDON.
Prize Medals, 1851, 1855, 1862, for
MILL BANDS, HOSE, AND LEATHER FOR MACHINERY PURPOSES.

OFFICIAL AWARD LIST.

VIENNA EXHIBITION, 1873.

The Official Award List, as originally issued by the Vienna Commissioners (August, 1873), shows that

HAYWARD TYLER & CO.'s



PATENT

"UNIVERSAL"

DIRECT-ACTING STEAM PUMPS

(Their only Exhibit being a Selection of these Pumps, for Mining, General Purposes, and Boiler Feeding, those applicable to the latter purpose being equally suitable for the former)

WERE THE

ONLY PUMPS

Of this Class, in the English Department, to which was awarded

THE GRAND PRIZE "MEDAL FOR PROGRESS."

One of these Steam Pumps was selected by Her Majesty's Commissioners for feeding the Boilers in the English Section, and H. T. & Co. have received the thanks of Her Majesty's Commissioners, as under, for its use:—

Vienna Universal Exhibition, 1873.

OFFICES OF THE ROYAL BRITISH COMMISSION,
VIENNA, 21*st November*, 1873.

GENTLEMEN,—At the close of the Vienna Exhibition, Her Majesty's Commissioners desire to take the earliest opportunity of expressing their sense of your kindness in placing your **Steam Pumping Engine** at their disposal for use in the British Section of the Exhibition, and I am to state that Her Majesty's Commissioners appreciate the valuable assistance you have thus rendered them.

I have the honour to be, GENTLEMEN, your obedient Servant,
(Signed) P. CUNLIFFE OWEN, *Secretary.*

Messrs. Hayward Tyler & Co.,
Upper Whitecross Street, London.

SOLE MAKERS—

HAYWARD TYLER & CO.,

84 & 85, UPPER WHITECROSS STREET,. LONDON.

Original Correspondence.

THE TIN FIELDS OF QUEENSLAND.

SIR,—During the past month the fine weather has been in favour of our mineral development, especially as regards the tin fields. Some of your correspondents ask for information as to the yield of tin, &c., that may be expected from this country. I have made it my business to-day to procure the latest and most reliable information to lay before them. The tin country lies at the south of this colony, and north of New South Wales, part in each, the boundry between the colonies running through it; but most of the tin ore from the New South Wales side, and the whole of that from the Queensland side, is brought to port by the Queensland Southern and Western Railway, received at Warwick, and delivered at Ipswich. After its arrival in Ipswich some goes to the Queensland Smelting Company to be refined (they are now smelting about 23 tons of ore per week, and are arranging for the erection of more furnaces), some is shipped to Sydney, and some shipped direct to London. The quantity of tin ore that goes by road to Grafton, in New South Wales, I cannot give any information about, further than it is not much. By a return which the railway authorities have kindly furnished me there were 499 tons 16 cwt. 0 qr. 7 lbs. tin ore received at Warwick Railway Terminus during the month of September; to get the total yield must be added the quantity that went by road to Grafton, New South Wales.

The Customs also kindly furnished me with the following information. Tin exported from Brisbane for the first six months this year, 1873:—

To London	892	cwt. ingots.
To Sydney	23	"
Total	915	"
To London	8,575	cwt. tin ore.
To Sydney	34,260	"
Total	42,835	"

Equivalent to about 1600 tons ingots in the six months. During July and August the following were exported:—

To London	410	cwt. ingots.
To London	7,695	cwt. tin ore.
To Sydney	20	cwt. ingots.
To Sydney	8,066	cwt. tin ore.
To Melbourne	420	"

I cannot send you September return as it was not made up. From these figures it will be seen that my estimate of 150 tons ore per week is a fair one.

As to our future supply experience has shown that the more ground is opened up the richer and more extensive our prospect becomes. At first it was expected that 12 months would work out most of the blocks. As work advanced it has been proved that many of the hills are extremely rich in stream tin to the very crown. But the style of working has completely changed. The big companies, a large number of which started into existence shortly after the discovery, are in most instances failures. Some are already wound-up, others lingering, and a very few have paid handsomely, but private companies and individuals who have worked their ground economically have reaped a rich reward. A large area of ground is now being worked on tribute with success, and to the advantage of the working miner. The returns vary, but generally the tributers sell the whole of the tin to the owners of the ground at a fixed sum per ton (clean and dry), averaging 35*l.* to 40*l.* A large number of lodes have been discovered, but as yet no attention has been paid them, and no sinking or prospecting done on them, as the stream tin is obtainable in such quantities, and requiring so little capital. Tin has been discovered in several other districts, but as yet none of them are proved rich enough to warrant writing about. As to our future supply the present quantity will be fully kept up, if not considerably increased, as British labour (a very scarce commodity just now) and British capital are brought to bear on it.

The account sales of our tin ore just received, sold in London June and July, has caused much dissatisfaction amongst our exporters. They have lost 5*l.* to 15*l.* per ton on all sold, and want to know the reason why? &c. The upshot of the affair is that the merchants and owners of tin property are determined to at once erect furnaces and smelt their own ore, and I fully expect before six months are over to see all the stream tin smelted on the ground. Our supply of coal is enormous, quality as you like it, and it only requires an extension of the present railway to the tin fields (about 40 miles) to supply the furnaces on the ground.

Mr. Daintree, our agent-general in London, has sent us out samples and specimens of Cornish tin ore which has astonished everyone who has seen them—they are so poor in metal in comparison to our yield. At present the poor ground is not worked, but the machinery and other saving apparatus now being introduced may cause an alteration.—*Brisbane, Oct.* 3. RESIDENT.

BROWN'S CREEK GOLD DEPOSITS, NEW SOUTH WALES.

SIR,—Some months since I sent you a short account of these extraordinary deposits, but as the ground has been much more opened since then, and the real value of it is beginning to dawn even upon ourselves, perhaps a little more information brought up to date may interest your readers.

The general shape of the main lode is supposed to be a circle, varying in width from 120 up to 300 ft. It commences on Sugar Loaf Creek with a bluff of some 200 ft. high, and runs for about a mile down to Brown's Creek (through Adam's and Weeke's, Flyn's, and Cooper's freeholds), thence over the creek, up the hill through Government leased land, and apparently into Adam's and Weeke's freehold, the whole course being nearly two miles. Its yield varies very much, being as low as 3 dwts. and as high as 15 dwts. per ton; but as it improves with depth, and the deepest shaft as yet is only 100 ft., it will probably go nearer an ounce at 200 ft.; at any rate, all practical miners who see it consider so.

The largest cutting at present is in the Government leased ground belonging to the Brown's Creek Gold Mining Company, and is over 200 ft. wide from the hanging-wall, and the foot-wall not yet reached. From this opening, and a few others reaching to the boundary of Adam's and Weeke's land, about 20,000 tons of stuff have been crushed, at an average cost from first to last, all expenses included, of about 4*s.* per ton; but as the battery was old-fashioned and defective, and as much as 10 dwts. per ton were assayed in the tailings, and as careful trials on a small scale privately had given 25 dwts. (1¼ oz.) per ton when the mill was only returning 6 dwts., it was determined to stop the work, and raise capital to put up new and improved plant. The old shareholders, therefore, sold one-third of the mine for 10,000*l.*, the money to be devoted solely for machinery. This is now nearly ready, and as it is from designs of, and erected by, Mr. Rees Davies, the engineer for the Port Phillip Clunes Company, it is likely to do its work thoroughly.

There is boiler and engine power for 50 heads of stamps, but at present only 30 will be put up, which will easily reduce from 2000 up to 2500 tons per month, as the bulk of the crushing stuff is a decomposed soft conglomerate of quartz, clay, flint, bastard opal, &c., so easily treated that it can be broken down, loaded, and trucked to the battery for 1*s.* 6*d.* per ton; and as the cutting is in the hill side, and from the grass down, everything pays. It requires no skilled miners, but only ordinary labour, with good superintendence, to open out the hill right through the company's 50 acres (leased from Government for 14 years).

Brown's Creek Freehold Gold Mining Company takes in all the corresponding hill around the Creek, and comprises 111 acres of Cooper's grant, and has more than double the creek frontage of its neighbour (the old company), and is held for 21 years free of all rent and royalty, with also the prior water right. It appears to be the centre of the "system of deposits," as, independently of the great main lode, the mere outcrop of which is here 300 ft., there have been opened up several smaller lodes, one of 10 and one of 40, being of a slightly different kind of stuff, but averaging rather higher both in quantity and quality than the others. Opposite the mouth of the tunnels and cuttings into these two the machinery is now being erected, and is under contract to begin to crush on Nov. 1 next, 1873. It consists of boiler and two engines, one for crushing and one for hauling the trucks, &c., and is guaranteed to crush 1600 tons per month; but the company expect larger profits than their neighbour (the old Brown's Creek Company), in consequence of having secured the right to a new patent crushing and concentrating buddle, which is just invented specially to save fine gold, and through a series of which all the tailings from the crushing battery will pass, and thence finally over catch-tables, so that as far as machinery can treat the material exhaustively on a large scale it will be done here—for the first time in New South Wales.

Competent judges estimate the return, even from surface to the 60 ft. level, as quite 10 dwts. per ton (if all the gold in it be saved); and as a little over 1 dwt. will pay expenses of treatment, such a yield will give fabulous profits, and if it only gives 5 dwts. it ought to net over 200*l.* per week, and as the lodes and deposits are of such enormous size, and promise work for a generation at the least, and as such company will doubtless increase the crushing power (out of profits), these Brown's Creek Mines promise to rival any in the world for dividends as compared to outlay.

On the south side, and adjoining this 111 acres, is a block of about 50 acres, in which the same material crops up in large isolated patches; and about the centre is an extraordinary "blow" or outcrop of honeycombed quartz and ironstone, covering some hundreds of square feet, some of the ironstone boulders being more metal than stone, and of great weight. No crushings have been taken, but several dishes of the deposit have been washed, and prospected about 6 dwts. fine gold per ton, averaging nearly the same from surface down to 50 ft. depth. From the back of this block no prospecting has been done, but at about half-a-mile to the south-east on the bank, or rather cliff, of Sugar Loaf Creek precisely the same great reef and deposit of conglomerate as described in the two Brown's Creek Companies claims, again outcrops for some distance, and in large patches in two freehold blocks of 42 and 40 acres each, belonging to Adams and Weeke, and Flyn respectively, and from the "run" of the country there is no doubt of its being very near the surface, as from the one creek to the other is about a mile, and there is only a break of some 500 yards in the centre of the run of the lodes, where it is not absolutely outcropping, although a quartz and flint pebbley debris of some hundreds of feet in width, every here and there, evidently indicates what is just beneath.

There have only been two or three shallow shafts and trenches cut in these two blocks, but the same average prospect of about 5 or 6 dwts. still obtains from the different washings. On the opposite side of Sugar Loaf Creek a granite range appears to be the final barrier, or very possibly the foot or hanging wall even, for the lodes, or deposits, are of such size and extent that all the work as yet done has not defined the exact shape or boundary of them; but from the general appearance of them, and judging from the underlies and dips of them in the comparatively few shafts and tunnels and drives as yet opened up, it is the opinion of all miners that they all make, or blend into, one large and much richer deposit at a moderate depth; and as our great geological authority here, the Rev. W. B. Clarke, sees no reason to dissent from it, the assumption is a fair one; and if it be true, then it will probably be the largest mine—a series of mines rather—that has yet been discovered anywhere, and the placers and gravels of California will seem insignificant by comparison.

At its south-western portion it is opened up right through the old Brown's Creek Company's leases to the boundary of Adam's and Weeke's freehold, following the course of a gully, which is abruptly blocked by a hill of some few hundred feet, on the far side of which, in a creek running through the centre of the freehold, the quartz and flint pebbles again indicate its track right through; but as the ground rises steeply into a table-land, no further surface indications have yet been found, though there is no reasonable doubt but that it goes into the heart of the country, but whether near the surface or not can only be proved by sinking or driving for it, which, from the indications in the next block, working miners will do at their own risk and expense if guaranteed a reasonable tribute by the owners, and the certainty of getting use of a crushing plant cheaply.

I have confined my remarks principally to the few great lodes known to be gold-bearing payably; but as a matter of fact, the whole surface of these hundreds of acres seems to be auriferous, more or less, as the "colour" can be got from a washing of any portion of the surface soil, and wherever a well is sunk in the alluvial flats, specks of gold are freely seen; and if it were not that the whole of the ground is in the hands of these two powerful companies and the freeholders there would be hundreds of diggers with "cradles" and "long toms," fossicking and sliming down to the very bed of the creek.

As mentioned in a former letter, it is the Rev. Mr. Clarke's opinion that the deposit is the result of a boiling spring, and that when the reefs are come at from which the widely and almost evenly disseminated auriferous mixture was fed they will be likely to prove very rich; and, as partly proving his theory, the stone which at the surface only occasionally shows a speck of gold here and there gives about ½ oz. at the 60 ft. level, and where it was lately come on to at the newly-opened 100 ft. shaft (the deepest) it looked still better; but whether the whole of these gold-bearing lodes and reefs blende into one large and rich widely-spread deposit below, or whether they do not, there is apparently enough of them in sight now to keep half-a-dozen large batteries at work night and day for the next 20 years, and whether as a gold mine, or as a great geological curiosity, the "Brown's Creek deposits" are well worth the looking at by either the miner, the capitalist, or the *savant* of science. The attention of the latter has already, in fact, been drawn to them by seeing previous communications of mine in your Journal and in the *Times*, and has led to requisitions for specimens, which I have sent to various parts of the Continent, as also to the New South Wales annexe at the Exhibition. ROBERT ADAMS.

Sydney, New South Wales, Oct. 4.

MINERAL WEALTH OF ARKANSAS, UNITED STATES.

SIR,—This State can, without exaggeration, boast of her mineral deposits, especially when we take into consideration the various kinds, their general rich quality, and enormous quantity. Here are magnetic, hematite, specular, calcareous, and other varieties of iron ore, silver-lead, zinc, and coal, manganese and associate metals, together with marble, gypsum, salt, kaolin, whet and hone stones, slate, limestone, granite, marl, paint and nitre earths. The coal fields of the State embrace an estimated area of 12,000 square miles; where the most coal mining has been carried on the beds are from 4 to 9 ft. thick. This coal is similar to the Cumberland coal of Maryland, and its quality, by analysis, is similar to that famous article of fuel, and it is an excellent steam and manufacturing coal. The Arkansas river runs for 500 miles through this coal formation, from the crossing of the Mount Kansas and Texas Railroad at Port Gibson to the capital of the State. This coal can be mined and transported to New Orleans in barges alongside of ship-board at 15 cents per bushel for six months in the year, during high water of the Arkansas and Mississippi rivers. At many places above Fort Smith the barges can be run in under clear banks of the best coal, and a line cut through the bank, and a barge loaded in an hour. The hematite and oxadulous iron beds in some places cover thousands of acres of surface, and where there is abundance of the best kinds of timber for making charcoal, and limestone of good quality for fluxing purposes, with never-failing large water-powers, are contiguous to those iron ore deposits. The advantages that Arkansas possesses must enlist the attention of the ironmaster and coal mining capitalists of the Eastern States and Europe as soon as these vast deposits are well understood abroad. Already great enquiry is made of the agents of the Mississippi Valley Society at Charing Cross, London, by English capitalists for investment in Arkansas mining property. Not only of reliable iron and coal lands, but for investment in the more precious mineral ore lands of silver-lead and zinc. The most prominent outcropping of the latter yet discovered is the Kellogg Gravel Hill argentiferous galena of Sulaski county. Dr. David Dale Owen, late State Geologist, says in his official report that the ores of these mines assay from 240 to more than 500 ozs. of pure silver to the ton of lead. And from the close proximity of this region to the Cairo and Fulton Railway, just completed, and also the St. Louis, Salem, and Little Rock, in process of building, already completed to the State line, of which Mr. E. J. Crandall is president, and also of the Illinois, Missouri, and Texas Railroad, who is now absent at London negociating capital to complete these roads. These argentiferous ores can be mined and transported to the silver refining and smelting works of St. Louis at $20 per ton, and $100,000 invested in that region would produce ten times that amount annually in the yield of precious metals. The best informed citizen gives it as his opinion that all they lack to render that region as productive in precious metals as Nevada is capital. If an Arkansas Valley Society and Institution, like the Mississippi, were located at London or Liverpool for the sale of Arkansas mineral lands and developed reliable silver and lead mines, besides the more intimate relations it would foster between mining capitalists of Europe and the great South-West, it would prove of immense profit to both sections or classes—the owner of thousands of acres of wild mining lands, and the English or French purchasers for immediate or perspective development and use.

Messrs. John M. Murphy and Co., large real estate operators at auction sales, commence in about a fortnight large sales of argentiferous lands, which they purpose disposing for Arkansas *uncurrent* securities, railroad aid, level and estate bonds, at par values. Messrs. E. J. Crandall and Dr. Price exhibit large lots of specimen ores of the Gravel Hill and Kellogg mines at the Messrs. Barings Brothers. The prospecting agents sent to this country by the Russian Mennonites report in favour of Texas for cattle raising, Kansas for fruit growing, Minnesota for the cultivation of wheat, and Arkansas as a combination of all. S. H. NIEMAN.

Little Rock, Arkansas, Nov. 12.

SILVER-LEAD MINES OF THE SNOWY RANGE, COLORADO.

SIR,—The Revenue Mine is situated on the back-bone of the Continent, one of its shafts being on the divide or apex, one on the eastern, and another on the western slope, each about 150 ft. apart. At present these three shafts are about 60 ft. deep, showing a continuous body of ore of peculiar combination. Grey copper predominates at the surface, and blue and green carbonates, with argentiferous galena and phosphates of lead, below. Drifts are now being run to connect the three shafts, and in no part of the mine (now opened 15 ft. from the surface) can be found a single spot with less than 8 in. of solid ore, and in many parts over 18 in. The average produce of the mineral is 250 ozs. of silver, 12 per cent. of copper, and 50 per cent. of lead. There are two different streaks of mineral, one of grey copper and the other galena. This is the first year this mine has been opened out, and several veins have been discovered in its vicinity this season, some carrying rich deposits of bismuth silver. In sinking a shaft on one—the Treasure Vault—lode near the surface, ore containing 1000 ozs. of silver per ton was produced, in a pit 5 ft. deep. These mines are situated from 11,500 ft. to 14,000 ft. above the sea level. From Revenue Mountain to the village of Montezuma the distance is about three miles along the range, which run embraces Glacier and Collier Mountains, on the western slope, which contain large veins of argentiferous galena, the finest yet discovered in Colorado, on account of the ductility of the metals they produce, and being free from zinc, blende, pyrites, and other impurities of a refractory nature, so peculiar to the ores os the eastern slope.

The writer visited and examined twenty mines on the two last-mentioned mountains this summer, all new discoveries, and found shafts on all, none exceeding 18 ft. deep. The average width of these veins is about 3 ft., and showing from 3 in. to 18 in. of solid mineral, containing on an average 125 ozs. of silver, and from 50 to 70 per cent. of lead. The reason these mines have not been developed more is the deficiency of reduction works. The nearest market is Georgetown, about 28 miles distant, while the banks of the Snake river afford one of the finest locations in the world for smelting-works, having abundance of water-power and wood for fuel along the banks of the stream and mountains adjacent to the mines, some of which are about 400 ft. below timber line. The ore from at least twelve of these can be placed at the foot of the mountain for reduction by one tramway, as they do not cover over half a mile of space. As soon as capitalists engaged in mining enterprises realise the advantages that may be obtained by erecting smelting works in this vicinity, and possess at the same time half-a-dozen of the veins above referred to, they will control the whole of the custom work of this rich mineral district.

The Silver Wing lode, on Glacier Mountain, at present is the only mine developed; it has two levels run on its course, one 450 ft., and the other 480 feet. The perpendicular distance between the two is somewhat over 100 ft., and at the breast of the latter it is between 400 and 500 ft. to the outcroppings. Overhead, along the adits, are large deposits of pargasite, with veins of brittle sulphuret and native silver; these are found extending for 40 ft. along the floor of the drift. The average value of the ore from this mine is about 400 ozs. per ton. This is at a point 470 ft. from its mouth, the end being over 500 ft. from the surface, where the ore only produced 40 ozs. per ton, thus proving in this mine that the mineral increases in richness as depth is attained. Overtures have been made to Prof. C. S. Richardson to examine and report on the mines above referred to, and it is to be hoped that he will be able to do so before the heavy snows set in.

Georgetown, Colorado. —— PERCIVAL STOCKMAN.

SILVER IN COPPER ORES.

SIR,—"Observer" is scarcely entitled to the appellation under which he writes in reply to my letter; if he had read it with a small amount of observance it would not require a corroborative statement of facts in reference to the object I had in view.

In the first place I have nothing to do with Mr. Barnard; he is no friend of mine, I do not even know him, have never seen him, nor am I in any way connected with him or his process of silver extraction. I believe some of his assertions are too imaginary, and his own ideas of capability too sanguine, so that you will perceive there is not the least mutual reciprocity existing between us, being quite a disinterested party.

Secondly.—I claim no precedence or pretext to honour in proof of facts in view of public good tested under my own daily supervision, and long since revealed to the mining world at large, through the medium of your Journal, which has been appreciated and practically operated on by those who were ignorant of its true character and combination of mineral properties. It also affords me some satisfaction if only to promote advancement, or endeavouring to open out a new source of commercial enterprise and home industry in this particular department.

Thirdly.—The mines I enumerated, with but one exception (Okel Tor, which has recently been suspended), are all at work, as well as others not included in the category, are now producing the greatest part (two-thirds) of all the ores now sold in Cornwall, nearly 3000 tons monthly; no small quantity of it were silver ores (as "Observer" remarks), independant of the total amount of pyritic ores of this class now sold by private contract through other channels.

Fourthly.—"Observer" admits the whole of the assays he has had made (Prince of Wales especially) contains a certain percentage of silver, and the least of which shows a trace of silver; probably 3 ozs. would be a trace perceptible on the ordinary cupel by the old method of dry assay, which is still adopted by some of the local assayers, and often gives doubtful results, being very imperfect and inaccurate from the volatility of the metals used to form an alloy in concentrating the silver, besides additional loss generally sustained by cupellation, which would more than atone for the current difference, as shown by the present improved system of analytical test and experience when compared with extraction by the old process.

Fifthly.—I gave convincing proof in my last of the two copper companies who have been extracting silver from copper and other ores for a considerable period at a remunerative rate. Another proof I had given me yesterday by the manager of two mines in the district I refer to that the ores *do* give from 10 to 12 ozs. of silver to the ton from those mines in which he has the management. I could adduce further proofs, if requisite, fully verifying all the statements I have made on this subject.

Sixthly.—I am doubtful if until lately many of the agents at the different mines are conversant or have an entire knowledge of the minerals with which their ores are associated, without submitting them to a competent test of their value—for example, take New

Wheal Martha when last worked, and compare it with the present system of working. What is the result?

Lastly.—I have no time nor inclination to carry on a newspaper controversy with anonymous parties, but will wait the result of my analyses and treatment of these classes of ores until (as "Observer" says) more extensive works are complete on a large scale, which I wish to see carried out, and "analytical chemists of high reputation" will be able to give the best decision of my average correctness and analyses. M. W. Bawden.

General Assay Office, Liskeard, Dec. 3.

Mr. Ball's Article on Rock Drills.

Sir,—In the article by Mr. C. Ball, C.E., on "Mining by Machinery," in the Supplement to last week's Journal, there occurs the following sentence in the paragraph relating to our Rock Drill:—"The objections we have against the McKean are the great number of strokes it *has to give*, reaching often to as many as 1200 a minute, and we consider this rapidity of action to be destructive to all machinery." We italicise the words "has to give," as they are peculiar. It should be perfectly understood that with less pressure the machine will make fewer strokes, and if a competitive trial of rock drills could be arranged we would undertake to work, beginning at 15 lbs. pressure, and running as high as might be desirable—say, 200 lbs. We have never worked above 100 lbs., although we have under that pressure often made 1200 strokes per minute, as he accurately states, and this by actual count.

As to "this rapidity of action being destructive," we admit, of course, the legitimate wear resulting from friction, which is, however, reduced to the minimum, and the parts being properly hardened there is but little wear, and very great wear must occur to render the machine inoperative. The great feature of our machine is the absence of all shock or strain upon any of its working parts, which admits of its working with almost unlimited rapidity and force of stroke, and without liability to breaking any part.

We should be glad of a full comparative test being publicly made at various pressures, beginning at 15 lbs. or lower, if any machine will start with less, and working up to the highest pressure at which any of the machines may be run. Various kinds of stone should be provided for the experiments, such as whinstone, granite, and emerystone; and various kinds of tools should be experimented with in each machine, including a plain bar of steel. We would further like a test of working the machines at high pressure against metal itself, say cast-steel, as this would show how far the machines can be depended upon for durability of their working mechanism, a superiority we think fair to claim for our machine. To bore rapidly and continuously without breaking, and have the facility of ready adjustment in all directions, are the chief recommendations for a boring-machine. McKean and Co.

32, *Lombard-street, London, Dec. 4.*

Mining by Machinery.

Sir,—With reference to the article headed "Mining by Machinery," by Chas. Ball, C.E., which appeared in the Supplement to last week's Journal, I am the patentee of the Barleigh Rock Drilling Machine therein referred to. Mr. Chas. Ball was my selling agent for such machine; I dismissed him from my employ on account of certain irregularities in his conduct as my agent, and instituted proceedings against him on account of such irregularities; but the hearing of such proceedings was ordered to be adjourned until after the hearing of certain civil actions pending between me and Mr. Ball. Under the above circumstances, I must decline to enter into any controversy in the Journal with Mr. Ball, but I trust that your readers will not allow Mr. Ball's criticism on my machine to weigh with them until I have had an opportunity of answering, which I will immediately do so soon as my charges against Mr. Ball have been disposed of.

96, *Newgate-street, Dec. 2.* Thos. Brown.

Steam Pumps at the Vienna Exhibition.

Sir,—A conspicuous advertisement in which our name is mentioned, inserted by Messrs. Tangye Brothers and Holman in various papers, including your own, will, doubtless, be considered to call for some notice on our part. The matter therein alluded to resolves itself into two questions—Firstly: How far the authorities of the Vienna Exhibition are justified in publishing one authorised list of awards in August and then, after various conferences between officials and disappointed exhibitors, issuing essential alterations in these awards in November.—Secondly: Whether we or the Messrs. Tangye Brothers and Holman have the most justification for what has been published by us respectively on the subject, in view of the undisputed facts of the case.

On the first of those subjects the *Engineer* has in its columns (see Nov. 7) spoken in few but very forcible words, and the question is one for the whole body of recipients of honours, and for the commonsense justice of the public, to which we gladly commit the whole matter. On the second the position we take up will, perhaps, be best seen by the following letter addressed by us to Messrs. Tangye Brothers and Holman, in reply to one from them requesting us to alter our advertisements, &c.:—

Messrs. Tangye Brothers and Holman.—Your favour (without date) is duly received this morning. In reply, we may frankly confess that it is not our wish to do anything to cause personal annoyance, and we regret if the course we have been obliged to take in self-defence has had that effect. As regards advertisements we are not aware that up to the present time we have anything to retract or anything to modify, and as for the future it rests entirely with yourselves how far we may be forced to publish matter which may be unpleasant to you.

Whitecross-street, Nov. 27. Hayward Tyler and Co.

P.S.—We think it may be desirable to point out to you that the letter of Baron Schwartz Selborn forwarded to us, expressly avoids stating *when* the words "*and pumps*" were added to the words steam-engine as officially published. Hayward Tyler and Co.

Whitecross-street, London, Dec. 2.

Miners' Conversations—No. VII.

Bill.—Our conversation a short time ago respected the brokers, some of whom are admitted to be honest men; but I will now give you a specimen of the Cornish mine brokers. Nine or ten years ago I worked in East Wheal Grenville, which at that time was looking well, and especially attractive to the jobbers in shares, so much so that I have seen more than 20 inspectors underground at the same time, the days of inspection being limited to Wednesdays only. The excitement was so intense that their descent into the mine was like a race for life; and I recollect on one of the inspecting days the foremost of the inspectors coming into my end, where there was a splendid bunch of ore, and, contrary to the rule of miners, he neglected to warn me of his approach whilst I was engaged in shammeling the stuff over my head, and, consequently, I undesignedly threw a shovelfull of stuff in the inspector's face!

John.—What was the occasion for the hurry?

Bill.—The object was to be the first at the telegraph office, after the inspection, to advise his London employer that he might operate upon the information received before either of the others could have the opportunity of communicating with their employers.* In this way sometimes, I have no doubt, hundreds of pounds have been gained in a very short time by London brokers?

John.—Do you know many of the Cornish share jobbers?

Bill.—Yes; and what do they know about practical mining?

John.—Very little, neither do they desire to know. All they aim at is to gain money by exaggerating the value of their own property, or depreciating that of others, so that they may take advantage in dealing with the unwary.

Bill.—I will now tell you of a chance I had when working in Wheal Grenville, about the time before stated, of earning a splendid gold watch and chain.

John.—Oh, what a temptation!

Bill.—Yes, you may well say so; but I declined the offer, because it was made for the purpose of inducing me to give a sharebroker information as to the changes taking place in the mine twice a week, immediately after coming up from underground. This broker was, in my opinion, a poor man, but he managed to present to another man in the same mine the gold watch and chain (which I had declined) for the information supplied in the manner above mentioned. On another occasion my son, a young lad, had half-a-sovereign put into his hand by a broker to induce him to give the earliest possible information to him as to changes in the condition of the mine; but on my son informing me of the gift I ordered him to return it at once, which he did.

John.—What broker was it?

Bill.—A broker then and now resident in Cornwall, and we see him figuring in the newspapers very conspicuously as one of the supporters of Capt. Teague's propositions. Another broker in the same locality also supports Capt. Teague in like manner.

John.—Capt. Teague, as you have heard no doubt, was unable to carry out his purpose of ousting the agents at the last meeting of West Seton adventurers. The majority was against that motion, but some people think that at the next meeting he will carry his point by buying up shares enough to secure the majority.

Bill.—If he can command in any way the majority on his side of course he must succeed, and carry everything in his own way, as he does at his other mines.

John.—I was much astonished when I heard that there was a balance of 2000*l.* or 3000*l.* in the hands of the purser of West Seton when a call was made at a previous meeting.

Bill.—It is very unusual in Cornish mining to do so, but it was done to keep up the *usual* balance, as the late Mr. B. Matthews had kept it; but it was wrong to do so when the money was wanted to carry on the works. This, however, is not likely to happen again, whether Capt. Teague assumes the control or not.

John.—Capt. J—— informs me that Mr. Ennor is engaged in preparing for the press a work on mining.

Bill.—So I find from the *Mining Journal*, but Capt. J—— says that Ennor would do well to submit the MS. to the perusal of some of the officials at the Jermyn Street Institution, that they may, if so disposed, make the composition grammatical and scientifically correct; for all who have read Mr. Ennor's letters must have perceived not only that he has a high degree of self-conceit, but he is also ignorant of English grammar and, as it appears to me, of the science with which he pretends to be so conversant.

John.—Are you not aware that he holds all those gentlemen in contempt?

Bill.—Yes; but he had better take Capt. J——'s suggestion if he wishes to avoid a tenfold greater contempt and ridicule of himself. He has been writing of Sir R. Murchison's visit to his house: he did not mention the circumstance during the *lifetime* of that distinguished geologist and mineralogist.

John.—Ennor made many ineffectual efforts to draw those gentlemen into a discussion, but they knew him too well to condescend to dispute with him; for Ennor will never admit any correction of his errors, but will always have the *last* word, however wrong he may be.

Bill.—I have heard that Mr. Robert Hunt is very clever in various sciences—geology, mineralogy, chemistry, &c.

John.—So have I, and Ennor would do well to ask Mr. Hunt's opinion on his proposed publication before he sends it to the printer.

Bill.—I will bet you 5*l.* that he will submit it to no one; he is above such a thing; he could not stoop to do it, and I question whether they of the Museum would condescend to revise it. And without the revision of the M.S. it will, I dare say, be a "funny" production.

John.—Ennor, they tell me, is not only ungrammatical and without science (he prides himself on being "practical"), but tautological also.

Bill.—Let us leave Ennor to himself now, and look at the mines for a minute or two before we leave. Don't you think that some companies have shown "exemplary patience"?

John.—Do you mean that they have waited long for profits, and in many cases in vain? There is Wheal Agar, which has been working for nearly 30 years, and has never paid its way, but always "calling" for money. South Seton was worked, I think, 10 or 12 years, and never yielded a parcel of ore of any kind. It went down with, of course, a heavy loss a year or two ago. It has been said that Mr. John Tippet, one of the shareholders, broke his heart on account of it; for after waiting the cutting of a lode, on which he placed his final hopes, on being informed by the agent that it was *poor* he was like one struck down. He died soon after. He was too *sanguine*: he had opportunities of selling at a good premium, but would not. He acted so at Creegbraws, where he lost about 7000*l.*, extending over many years. He had a heavy interest there, and he had *two* opportunities of selling at a good profit after working many years, but he held on and lost all the money. The great art of mining is to throw off the loss from yourself to other people. *Sanguine* people never do that.

Bill.—Sometimes shareholders do well by holding on: for instance, in West Seton, Wheal Seton, and West Frances works were carried on many years without much result, but afterwards good profits were made, as you know, in each of them.

John.—The shareholders in all three were men of money, and such persons only should speculate largely. A man to speculate in anything should have money of his own, and not trade upon that of other people, like many do, throwing their liabilities on their co-adventurers.

Bill.—That is the evil of the Cost-Book System of mining, every shareholder being liable to the payment of all claims on the company.

John.—But that evil may be prevented by the provision of a sum in advance sufficient to pay the costs till the next meeting of the company, and then by making a call for the next two or three months; but if that be not done the liability may be limited to a very small extent by bringing up all costs to the account-day as closely as possible, dividing it among the shareholders, and compelling payment from each where compulsion is necessary. The Cost-Book System has been sadly abused in practice and theory.

Bill.—Is East Basset Mine carried on on that principle?

John.—Yes, and that brings to my recollection something that the managing director said at the last meeting held there. I mean Mr. Phillips, of London, who is also managing director of a good many other mines. He said that he had in two years just past expended 20,000*l.* of his own money in mines in Cornwall, but he expected to be amply rewarded for his investment in them. A shareholder who was present at that meeting told me that he looked very cheerful and happy.

Bill.—He is, I believe, the managing director of ten or a dozen other mines, and a good one he *is*, for he takes care that the purser shall never be short of cash for the pay-days, so that we *poor* miners are never disappointed of our money, as men have been in some mines that I know.

John.—The putting off a pay-day is ruinous to the credit of any mine, especially if postponed for two or three weeks. It is well to have a man of substance, like Mr. Phillips, at the head of affairs.

Bill.—Phœnix Lead Mine, in Perran, is one of his, which I find is opening out well. They are already returning 5 or 6 tons per month, and the quantity is increasing. The prospects are said to be very good. This is one of the mines of which Captain R. Pryor is purser and manager; but I am told that Capt. Pryor's chief mine, and a great prize, is New Great Consols. Agent.

St. Just, Dec. 2.

* I have known a broker to keep possession of the telegraph wire for a whole forenoon.

Miners' Conversations.

Sir,—My attention has been lately directed to certain "Conversations" between two miners, and reported in the Journal, in which my name has been freely handled, and I am stated to possess not only numerous virtues, but several good mines. As I cannot ascertain who the writer of the conversations in question is I shall esteem it a favour if he will kindly forbear from referring to me in future. My connection with Wheal Kitty (St. Agnes) is well known to the mining public, and it is also well known that the mines under my management are good properties, and will soon speak for themselves. New Great Consols is undoubtedly a magnificent property, and, as I have often repeated, is second to no mine in the county, as will be seen when we have completed our heavy outlay in preparations for increased returns. Public attention must before long be directed to this property, and recognise the truth of what I state. No mine in this county with only 60 heads of stamps has ever produced such results as we have shown in the same brief period, and if the underground cost of production were known it would simply astonish every reader of the Journal. I am happy to state that the mines never looked so well as they do at this time, and the bottom of the mine is opening up splendidly. As regards East Basset Mine, we shall get into a good position, but we have had much extra trouble and additional cost, owing to the scandalous state in which certain parties had left the mine. This mine, like New Great Consols, in a short time will also tell its own tale.

Trefula, Redruth, Dec. 2. Richard Pryor.

Miners' Conversations.

Sir,—I see that some of your correspondents have been remarking on these conversations; one of them talks about "puffing" Capt. R. Pryor. I am not an agent under him, but I may say that "good wine needs no bush." The miners whose conversations I report, no doubt, know his sterling honesty, and therefore speak well of him. Your readers must not take amiss my echoing their sentiments concerning him. The conversations will be found to be very long, and will require a large amount of space in the Journal. Agent.

St. Just, Dec. 4.

N. Ennor to Anonymous Writers.

Sir,—I see that your anonymous correspondents have not made an appearance this week. They are not miners; only book-taught students, who cannot pass muster. One accuses me of so laying out Drake Walls as to have killed one-half the men, whereas I never had anything to do with the management. Another says I threw away the Treburgett silver; he had better ask Capt. Hancock if he ever found a single ton of silver ore in the mine. Treburgett lead is the best in the county for its yield of silver. It would have been very strange should I have thrown it away, as I made two slime pools. But I admit I never cleaned a ton of slime when at the mine. I left two pits full, and no one will take the trouble to see what it will pay them for washing it. If any silver were wasted it would certainly be found in the slime, inasmuch as I had no Red river to throw it into. I opened two of the mines, paid outlay and interest, and netted thousands. I left the mine for a better situation, where my salary was double. The mine was worked by a captain for six years after I left, and I drove a level to unwater the old mine for him; but he was only book-taught. He never plied a pick in the old mine, that was high and dry. The present parties, fortunately, turned their attention to the bottom of the old mine I had unwatered, and there they find their lead now. I am right glad the mine is turning out well with them.

Turning to silver ore, I would not work a mine for it in Cornwall or Devon if I had half the product as a gift. I have worked in many mines, but never saw or knew of one that paid for silver. Herland Mine produced the most, and there they lost money. Dr. Sargent has been mining for silver full 60 years, and he will end a loser. What Mr. Barnard is about to do I cannot say, but I think he stands a better chance than his predecessors, if he can find a new and cheap process for separating the ores. I say to him, go on and prosper. Were I at leisure I would go up and spend a few days to see what he is doing. I know the district well, and have mined, I may say, in every inch of silver ground from Callington to the Tamar. I am aware that nearly every lode contains silver. If ever the ore can be made to pay, it is not by merely working and picking out the crop: it is not good enough to pay the expenses. I have broken it, and picked out the best, and that did not pay expenses. What I threw away paid afterwards. I remember breaking sufficient to fill a large chest with best worked silver, worth fully 200*l.* It was kept locked in the office, under the care of the captain and assay-master. I had to take it to the smelting-house, and there was not 20*l.* worth in it. I was sent to Devonport expressly to watch a man, and followed him into a specimen shop in North Corner-street, where he had his lot all laid on the counter. He had exchanged 5*l.* worth of silver for an old watch not worth 1*l.* That is the way good silver goes.

I notice that someone says I am no miner, and he is quite right. I am not half learned as a good practical, still I will challenge any man in the county to take mining up in all its branches: I care not two straws whether he is school-taught, a professor, or a pupil. I have been a miner long enough to get my bread and beef. I could get money now quicker than ever I did if I wanted it. I have no greed after money. I have been mining in my own way these 70 years. I will not go into the details of my mining career. I have worked in more mines than any man in the county, surveyed more mines than any man in the world, have been captain longer than any man in the county who has not been brought into a mine under his father's wing. I have fought more battles with book-taught and would-be miners than any man. I have found and worked many paying mines, and also slate quarries, and worked them all to a profit. I have two silver medals, and was awarded the gold medal at the Vienna Exhibition for the best quarry and slate that I found and brought out in Portugal. I have had Sir Roderick Murchison come to consult me twice in Cornwall. Stephenson, the great railway engineer, consulted me when at Delabole. He returned to London, and brought back with him Gurney, Burnell, Miller, and Gold, and wanted me to go by railway with him. I set up all the travelling cranes, now so common all the world over, for Messrs. Johnson and Co., for the Plymouth Breakwater and Dartmouth Quarry. I also got up the air furnace for welding the large iron plates for ships' sides, for Cottam and Allen, at Millwall, to aid John Yellon, formerly my smith, from St. Stephens: I think his wife is still living there. I invented the single-incline chain rail, to draw wagons over, and to load vessels at sea, and worked them near Boscastle for years: but, like my buddles, it will take 30 years for Cornishmen to understand them. I undertook to launch the Great Eastern iron ship, when she stopped on the slide at Millwall, for 1000*l.*, for the builders. The next day the Government took it into their own hands, and in six weeks spent 46,000*l.*, and could not start her. When they saw my plan at the office they adopted it, and the vessel moved off without any aid, even before they were prepared for it, and she floated up the river half a mile with the tide.

Then, I hold letters from Sir John Packington, asking me to aid them at the Admiralty Office; and letters from R. Kindel, Esq., who took me to Sir John Hay; and from the present Cornish county member, H. Williams, Esq., advising me to take to English shipbuilding. I hold letters of thanks from Sir John Burgoyne and from Col. Jervis, who planned the Plymouth Garrison, and built it. He is now deputed to erect garrisons down the River Thames to protect London. I wrote a pamphlet on how to protect England: it was the means of getting the experiment tried on Dartmoor, by trenching.

Then, I challenge the world, after 50 years mine surveying, to prove that I ever took a bribe of any man. Within the last year I have been offered bribes, as a commission, in sums that would have set book-taught professors on their legs. Then, what did I do? I took what they would give me, and requested my employers to deduct it from the purchase money, and thus lessen the amount. I never purchased nor sold a share in a mine in my life. When I took up mines I worked them to a profit. I got 20 shares in Treburgett for an old debt, and was much pleased when I found that the mine was paying dividends; but I never got a shilling after I left it: the book-taught captain could pay no dividends.

I am asked to answer my own questions: I have all ready done so. I published diagrams and answers to my questions 20 years since. I showed how lodes go in the earth, and how the north and south dips occur. I sent them to Sir Charles Lemon. He was then chairman of the Geological Society. I hold his letters of thanks. He wished me to join them, and attend their meetings. I must say that Sir Charles was very civil, and never opposed the view I took of anything. I am now asked by students and book-taught miners to answer my own questions. I have already published answers to most of them, with diagrams. I ask who is the professor that has attempted to prove me wrong? My diagrams are now to be seen in the British Museum—go there and find them; but the better plan would be to go practically to work, and solve them for yourselves; or wait until my book comes out, in which I shall answer every question according to my own views. Then, I say to the man who pretends to teach mining, and does not know that ores grow,

that he will be confused when he sees my book. Let him tell the world what there is in creation that does not grow. But I stand my ground, as I ever did and do still tell them that the majority of what they write in books is only waste paper, and amounts to nothing.—*Wadebridge, December* 1. N. ENNOR.

WEST WHEAL SETON, AND ITS MANAGEMENT.

SIR,—Knowing the circumstances which caused the last meeting to be convened, may I ask the favour of your inserting the following statements in the next issue of the Journal?

The mine is in the land of Mr. G. L. Basset, of Tehidy Park, and is situated about ½ mile north from the town of Camborne. It has been the richest copper mine discovered in the immediate district for the past 30 years, and during the last 18 years has given profits amounting to more than 250,000*l.* In opening out deeper sections of the property, however, the lode is not found so productive of copper as formerly, the return from that ore at present being about 9000*l.* per quarter. In the meantime the lode appears to be increasing in value for tin ore, which produces at this time about 40 tons per quarter. The mine may be said to be in a transition state from copper to tin—a peculiar characteristic of the mines of this locality when reaching a depth of 150 to 170 fathoms.

In the early part of the year many of the shares which had been held for a long period on account of the dividends derived from the sales of copper were placed on the market, when Capt. W. Teague, the manager of some extensive tin mines in the neighbourhood, believing that a valuable mine of tin ore lay in West Seton underneath the immense copper deposits, bought up a great number of the said shares, and as a matter of course some of his friends, who followed his opinion with success elsewhere, became shareholders in the mine also. Capt. Teague, with both some of the original and recent shareholders, and amongst whom may be reckoned the largest holders, considered it necessary for the future well-being of the mine that some change should be effected in the management, hence the meeting in question. Capt. Bath, the present manager, who they say is an excellent copper miner, has not had that experience in tin mining as have many who are conducting the operations at several of the tin mines of the neighbourhood, especially in laying out a dressing-floor, with its almost interminable apparatuses essential for the proper cleansing of the tin ore, as well as for arresting it from being carried away by the waste water of the mine down into the notorious Red River, which skirts the northern boundary of the sett. It will be clearly seen from the following facts that the crude method adopted at West Seton for tin dressing is by no means so effective as it should be. The Red River is parcelled out into allotments, which are worked by a series of small companies for some three or four miles in extent, beginning at Dolcoath and terminating at the sea. Now, Sir, a casual observer would very naturally conclude that the parties situated nearest to the famous Dolcoath Mine—the fountain head—would succeed in securing from the slime and sand washed down the largest quantities of tin, but such is not the case. From certain returns issued in March last, the greatest quantities of tin obtained from the river was taken out by two or three of the occupiers of allotments at the foot of West Seton sett, quite a mile below Dolcoath, and into whose works pass directly the waste water containing the sand and slimes from that mine, and many are of the opinion that 40 or 50 per cent. of their tin is derived from this source; which opinion is corroborated by the fact that on the opposite side of the river, where this tin waste does not reach, probably no more than half the quantity of tin is saved. Moreover, the person who owns the first of the stream works mentioned above, and who has the first dip into the West Seton slime water, has been selling about half as much tin as the whole quantity returned at that mine during the past quarter.

Considering that the returns of the parties who have the first benefit of the tin waste of this mine amounts to more than 10,000*l.* in a year, and that 40 per cent., or (say) even 25 per cent., is obtained therefrom, this in itself, if arrested from that waste prior to its being washed out of the sett, would admit of dividends to the shareholders, according to the present commercial value of the shares, at a rate of interest equal to 12 per cent. per annum, which is exactly treble the rate of interest received by the Dolcoath shareholders on the present market value of their shares. Notwithstanding these facts, there were some shareholders at the meeting who deemed any alteration in the management altogether unnecessary.

When Capt. Teague stated that he feared the whole district would be endangered unless the mines could be worked without making *calls*, I am puzzled why gentlemen should sneer at the assertion, knowing as they do, that he has already invested heavily of his own capital into that district. Why, he has purchased, and still holds, near one-third of the adjoining mine, Wheal Seton, which I believe would have been a total wreck ere this but for his aid; and I can venture to assert that at this time he holds quite one-eighth of the mine in question—West Seton. Now if he be not sincere in these statements, will they point out a man throughout the whole county whom they believe to be more sincere than he who will mould that sincerity into a more practical form?

For outside shareholders in our Cornish mines there appear to be only two things left—strict economy, and managers with the moral courage of Capt. Teague to apply that economy. Do this, and the mines of Cornwall will not be poor. C.

Camborne, Dec. 3.

WEST SETON MEETING, AND BEARDING A "BEAR."

SIR,—All praise to such good and true men as Messrs. Lanyon, Loam, and Cartwright, who so nobly and successfully bearded the Camborne "Bear" at the late West Wheal Seton meeting. It really seems there are only just a few left of those good and true men to their agents, who in prosperity are all in all, but the moment adversity sets in the honest and ever faithful captain must be dismissed, regardless of honesty or ability. Do those few Camborne brokers who hunt up the game for the "Bear" suppose for one moment that Mr. Basset, in his great liberality, would have been content to see those agents scattered to the wind and tide? Would it be at all likely that the West Seton dues would, with various other privileges and concessions, have been granted to the present troublesome believers of the district in danger? Most certainly not; for be it known the lords would have within the next quarter given due notice of their intention to go back to the terms of the lease, and exact their legal dues. And, moreover, what about a new lease? It is a question if that would for one moment be entertained. West Chiverton and other mines are smarting from similar despotic misrule. J. HARRIS.

Redruth, Cornwall.

LLANRWST MINE.

SIR,—My first impulse on reading the missive of that eminently contemptible poltroon who signed himself "Pedestrian," in the Supplement to last week's Journal, was to treat it with contempt, it being such a palpable and clumsy slander; but, on reflection, I concluded that there were those whose pecuniary interests in the mine were much greater than my own, and whose information regarding its value rests upon a different basis. I have, therefore, decided to controvert, in language which cannot be mistaken, that cowardly act, and, in the first place, I denounce the article in question as a malicious fabrication—as untruthful as it is uningenuous. There is not one word of truth in what he has written concerning the mine, whether relating to the quantity of ore at the surface or the prospects of the mine underground. I cannot say all I would say here, but I unhesitatingly pronounce "Pedestrian," whoever he may be, a wilful perverter of the truth, and challenge him to disprove the allegation. If he does not know more of mining than is displayed in that and former letters which I have read from his pen it is criminal to encourage him to write on the subject; but if he does know better, by whatever motives he may be actuated, his conduct is equally reprehensible, as usually any preference between the two classes represented by R. and F. is very lightly esteemed. I know it will be useless to ask him to meet me on the mine, and bring those with him whom he alleges took him into their confidence; but I publicly challenge him, nevertheless, and those who are with him—if anyone—in the statements he has made, to meet me and investigate the solid foundation upon which the future success of this mine rests. This is all which can be done until the mine is sufficiently advanced to tell its own tale by the returns it is destined to make, and then your pertinacious correspondent will be proved to be what he can only now be designated—"an *egregious manipulator of falsehood.*" I have now only to add that no one who can be construed into this mysterious personage has ever been seen on the mine. He may esteem himself very clever in impersonating the "Sneak."—*Llanrwst Lead Mine, Dec.* 3. ROBT. KNAPP.

LLANRWST LEAD MINE.

SIR,—A letter having appeared in last week's Journal (an attack on the property and prospectus of the company), signed "Pedestrian," we should naturally presume "Pedestrian" was travelling through on the mine in question in his general survey of the district. If he were a judge of the mine, and a judge of the piles of mineral ore work raised at the surface, he might have been in a position to estimate its value; but this man, according to his own admission, has insinuated that he has based his information upon that which has been afforded to him in the district. Is this honest? Is it fair? We doubt whether the author of the letter referred to was ever in the district, and question whether he was not 300 miles away when he wrote the letter. The attack is unwarrantable. The company have applied to the Journal for the author of the letter, and intend to adopt the necessary course for its protection against such a vile attack.

85, *Gracechurch-street, London, E.C.* ENDEAN AND CO.

LLANRWST MINE.

SIR,—In last week's Journal an unwarrantable attack has been made upon this valuable property, and I think with very bad grace on the part of the proprietors of the paper to have allowed such letter to have appeared, especially from the admission of "Pedestrian," or tantamount to it, that he had never been on the property. Although he signs himself "Pedestrian," he would insinuate, or have your readers to understand, that he had been travelling through surveying the district, giving his opinion from general observation, but at the conclusion of his paragraph he pretends that what he has written has been based upon information which he has received in the neighbourhood. This bogus, whoever he may be, would have done well to have gone on the property, and to have seen for himself ere he had ventured his remarks; unless there was really animus, he must have been ignorant of the damage he was doing to the company. For the information of your readers, this bogus have never been on the mine, and knows nothing whatever of its present position, prospects, and its future capabilities. His attack, therefore, is unwarrantable, and should redound on his credibility. I would also note that, being secretary of the company, I am not aware that I have ever given cause for anyone taking umbrage at me to write such a paragraph. So far as the mine itself is concerned, I am quite satisfied that it is a property of legitimate value, and I am only too pleased to be connected with it. H. YEATES,

Secretary of the Llanrwst Lead Mining Company (Limited).

"ORIGINAL CORRESPONDENCE" IN THE "MINING JOURNAL."

SIR,—The gentlemen writing under the above heading expressed regret in their critique in the Supplement to last week's Journal that I should have said nothing in my letter of Nov. 22 concerning "granite or fossils." I was not aware, after the candid explanation which I gave in a former letter respecting this matter, and the turn which the discussion subsequently took, that any further obligation rested upon me. I gave my authorities for the granite theory, and took upon myself the entire responsibility for the statements made concerning the "fossils." Both statements may be wrong, but I have no reason to believe that either is. With regard to granite having been found at Trefriw, I named as my authority a mercantile gentleman of that place, and also that his information was supplemented and confirmed by a report upon the ground in question by Mr. W. Roberts, of Carnarvonshire, who is locally accredited as being an expert in such matters. I stated these facts as plainly as I now state them, and they were disposed of in the following convenient and summary manner:—"It is ridiculous to think of a man bringing such accusations against his mining brethren, and proclaiming in the face of the world that granite occurs at Trefriw, and when he is asked for his authority declares it to be a 'village grocer.'" Now, I would like to ask the critics who sign themselves "Readers of the *Mining Journal*" if such a rendering as that of an explanation so clear, and which I intended to be candid, and still believe to have been so, is true or false, and if false whether it was not intentionally so, and with what objects if not a perversion of the truth? I esteem the wilful distortion of my facts by an opponent in controversy as being equally reprehensible as the manufacture of his own for unworthy purposes can possibly be, and though those amiable critics seem to think that I treated the matter with some degree of "flippancy" my own opinion is that I should have been justified in passing it without any notice whatever. But since they have goaded me on I shall now say that if there is no granite at Trefriw others, and not myself, have been mistaken. I have given two very respectable local authorities, and if they are not sufficiently good in the estimation of their own countrymen I can only say I am exceedingly sorry, and that the aspect is not a very flattering one for my opponents themselves. And now a word to "Readers of the *Mining Journal*," who, I think, have descended a little below the level of true criticism in censuring me as they did a week ago for writing on a subject concerning which I had not had ocular proof. May I not now ask these gentlemen if this is not a little too critical, and would not such a restriction, if generally enforced, tend to narrow to too great an extent the area of human knowledge? To discard, or even to sceptically question, all ideas which do not enter the mind by the avenues of vision would be to ignore history and to commence a recession towards the dark ages. I shall not contend that the granite theory is correct, but the fossil theory I shall hold to until it is shown that the basis upon which it reposes is fallacious, and I think that I am in possession of sufficient evidence to stagger equally able and ardent supporters of an opposite theory to those who have opposed me.

With regard to granite, to enter critically into that question it would, first of all, be necessary to decide what its essential constituents are, so that it may be clearly understood where granite ends and porphory and trachyte begin. Geologists and mineralogists are both agreed, and practical miners concur, that there are several varieties of granite, which differ almost as much in their adventitious composition as sedimentary rocks of the same genus do; and that this is true cannot be denied without doing violence to truth and sense, and not only are there granites of different kinds, but of different ages and periods also. There are primitive and secondary forms, and who will undertake to say that there are not sub-secondary forms, if such a term is admissible? I have seen trachyte similarly compounded to primitive granite, equally hard, crystalline, and resisting, and yet enfolding in its close embrace, in brecciated form, detached pieces of clay-slate. What a problem is this for solution! According to the igneous theory of rock formation, granite was once molten, or in a semi-molten condition, under great pressure, in a high state of incandescence, in which state it is reasonable to infer that its several component parts were intimately and mechanically mixed—that is to say, that the several specific ingredients in such a state of decomposition were more promiscuously and mutually disseminated throughout the mass; but that on cooling, we are told, the mysterious power of affinity exerted itself, and atom after atom of kindred affinities rushed to each other in rapid succession, and embraced each other with a tenacity and subtle force which only cohesive attraction can exert. This is highly rational so far, but the most mysterious part remains unsolved. What was that protective power or force which encircled, as a halo, and preserved intact that comparatively fragile extraneous substance—the fragment of clay-slate? If the igneous theory be correct as to the formation of granite, that clay-slate had withstood the action of tremendous forces, imponderable and dynamic, whilst much more enduring and resisting substances were entirely dissolved and metamorposed, it had been under a pressure which utterly destroyed the identity of substances many times harder, and it withstood the action without sustaining the slightest impression whatever; it had been subject to an intensity of heat which had rendered plastic ordinary infusible substances without itself being affected in colour even, or its delicate angular edges made less delicate and angular by contact with such immeasurable forces. And I have seen granite as primitive—apparently—and massive, and as highly crystalline as the Cornish or Darmoor moonstone, encasing rocks of clay-slate, and other extraneous rocks, in a similar manner to trachyte. How are these facts to be reconciled with the popular theory concerning the origin and formation of granite as being the oldest and deepest of all the rock formations constituting the earth's crust?

I have seen too many of man's fond theories opposed by facts in nature itself to blindly endorse what may fairly be termed theoretic concoctions; and when I find that the leading geologists of different countries are not agreed amongst themselves regarding even fundamental facts—some placing granite as the foundation of the rock system of our world, and others assigning it an intermediate position in the general order, but most superficial, of the rocks termed igneous—I certainly, as an explorer and observer of facts disclosed by physical and mechanical development in the most abstruse regions of nature's multifarious arcana, am entitled to exercise my own judgment upon facts which professed geologists shrink from attempting to either rebut or explain. But if geologists were agreed amongst themselves, and their conclusions found on an investigation to have been deduced from an unquestionable data of facts in nature, instead of premises hypothetically constructed, it would be proper, in deference to such conclusions, to waive opposing individual opinions. But a great many of what are termed, and pass current for, scientific discoveries, and are generally accepted as such, are, I know, in some instances, derived from and rest upon insecure bases—propositions arbitrarily laid down from certain very partially investigated phenomena, whilst the deductions therefrom are erroneously held as absolutely, instead of as they really are merely relatively, true.

If as a practical miner I am wrong in the views I entertain regarding the particular geological formation in which these mines are situate, does the duty of those who oppose me and who call themselves adepts in the science of geology terminate by their merely negativing the position I assume, without undertaking to invalidate the individual fact upon which my assumptions rest. If a geologist erred in his views of practical mining and I controverted his error, I should consider myself a meaner man than I ever found myself to be if I merely contradicted without endeavouring to enlighten him as to the source whence his error proceeded.

Llanrwst Lead Mine. ——— ROBT. KNAPP.

THE "ORIGINAL CORRESPONDENCE" IN THE "MINING JOURNAL."

SIR,—"An Old Colliery Viewer" is rather late in writing on "Iron and Coal Speculations." Timely warning would have prevented some abuses probably; at least, it would have prevented some of your readers embarking in these speculations without further enquiry; but now if the retribution your correspondent prophesies should follow, we fear that that will not bring back the misplaced cash into the hands of the rightful owners. "J. G." gives an interesting account of the "Iron-Ores on the Lahn;" Mr. James White continues his valuable notes on Mexico; such letters being very much valued by your readers, we compliment the writers. Mr. A. V. Weiss gives us some good information on the lead in Missouri, and we think can give us more. Mr. A. B. Mitford's last sentence, *re* "The Flagstaff Mine, and its Management," is good, and we agree to suspend our judgment for Capt. Forbes' return. "Observer" contends that silver was known to exist in copper ore from some mines before Mr. Barnard's discovery. We believe no one has made a contrary statement except Mr. Barnard himself, and, probably, he may deny having done so, but his bumptious letters would lead to that inference. "An Outside Shareholder," writing on "The Cardiff and Swansea Smokeless Steam Coal Company," seems a difficult person to please. If not satisfied with 10 to 15 per cent. paid in dividends, and from 5 to 15 per cent. more held in reserve for a rainy day, we would like to know what county he came from, and if he can get more satisfactory investments there?

Messrs. W. Marlborough and Co. give a hopeful view of Mining in Wales. Messrs. Tredinnick and Co.'s letter retails some of the information given in Mr. Disraeli's speech in the North, and the latter part puffs a mine or two where we suppose Mr. Tredinnick is interested. "Miners' Conversations" still go on, puffing Captain Richard Pryor again, which we suppose must be very gratifying to him. Mr. Ennor is getting more annoying than ever. Some men truly live beyond their proper time. Yet we fear there never was a time when Mr. Ennor could give lessons on practical mining of any value to anyone. Mr. Ennor did pretend that he sold tin from Drake Walls Mine, and now he says he "Never had anything to do with the management of the mine further than as a workman," and that he worked in Brenton's shaft. We ask, did the shaftmen dress and sell the tin in those days? Mr. Robert Knapp is rather pugnacious this week, and not so instructive as usual; we would rather see him discoursing more scientific lore. "A Shareholder" on "The Responsibility of Directors" has, no doubt, been wounded, and is very sore, but there are so many conflicting statements *re* the Flagstaff Mine that it is getting rather a sore and tiresome subject with us. "A Miner" gives us a letter on "Tavistock, and its Mining Prospects," This has been a fruitful district, but excepting Devon Great Consols and one or two of lesser note rather a deceptive one. "C. P." appears afraid he is going to lose his salary for the thirteenth month, but he cannot show that this unnatural arrangement does not very much disarrange matters. We do not say that more frequent payments may not be necessary, but think that some alteration from the present thirteenth-month system is imperatively necessary.

"Observer" may rejoice in Capt. Teague's defeat at West Seton, but we think his feeling carries him too far. We do not desire to see Capt. Teague recede from the acme of his glory, never having envied him in his success, but if we stood in the position of the present purser of West Seton we would call a special meeting to pay a 10*l.* per share dividend, and thus appropriate the cash balance which seems to be the temptation to interference. The three letters on Fortescue Tin Mine may be passed over with the remark that if they have tin there why not sell it, and thus destroy the power of "bears" and other beasts of prey? "A Miner" writes on New Great Consols. This mine has been held up as a great success, but we are not aware that they have made any profit, nor have we heard that they are ever likely to do so. We would be sorry to see Holmush re-worked, having been worked many years, always as a losing concern, and not likely to lead to any good now. "Truth" seems to us to gauge the calibre of New Fowey Consols and its promoters pretty accurately. "A Shareholder" asks an important question *re* Castle-an-Dinas, but does not enlighten us sufficiently as to the facts to enable us to form a judgment on the matter. Possibly the 1000*l.* "Shareholder" regards as assets may be all due to merchants and others. "Interested" seems disappointed at the result with Fron Vellan Mine, and "Miner" at the stoppage of Wheal Luey. Not so the writer of the letter headed "Tregoss Common Tin Mine," who seems to have one of the most wonderful things in that most wonderful neighbourhood. "Pedestrian" is only one among many who have been deceived in the quantities of *lead* at surface, the writers having known many old and good miners in other minerals vastly deceived by this showy ore. We do not say that in the Llanrwst Mine the deception complained of was or was not intentional: we merely mention one deceptive characteristic of lead ore, which, if not guarded against, may deceive many more. "Country Shareholder" describes an abuse, "False Quotations," which cannot be too strongly deprecated, and if he will only persist in endeavouring to carry out his suggestion he will be conferring a benefit upon the mining community, such improper proceedings as he describes not being in the least conducive to mining prosperity, but just the contrary. We think the same remarks may be applicable to the following letter, "The Tecoma." Mr. Barnard. Yes, if he "can really turn poor mines into sources of wealth," the odium upon his cognomen *shall* be entirely removed; but we are not to be satisfied, and we hope not again deceived, by Mr. Barnard's promises. It is high time to expect some results.

We may go out of our way to state what a valuable contribution to scientific knowledge is promised in the series of lectures "On Heat," delivered at the Royal School of Mines. How important such papers are to the general reader we well know, while to the students at the various institutions and other places where technical education is sought we can well understand how attentively their re-reading will be listened to. Thanks to Prof. Guthrie for their delivery, and to the *Mining Journal* for publishing them.

READERS OF THE "MINING JOURNAL."

AMERICAN MINING AND ENGLISH MINING.

SIR,—Mr. Longmaid has written some sensible remarks upon the causes of our failure in American mining. It is only to be regretted that his advise comes too late, when we are all cursing our folly in having embarked in such wild enterprises. The causes of failure are, in truth, sufficiently perceptible. The mines were bought for hundreds of thousands of pounds when they were not worth one-tenth part of that sum. Indeed, experience has proved that an American mine is not more valuable than an English one; for, although the former is far richer in the precious metals, the working expenses are proportionately heavy. If to this be added the severity of climate, which interrupts all traffic for months in the year, the insecurity of tenure in a land where the law of the revolver is the only one that obtains universal recognition, the absurdity of the mining laws, which seem expressly framed to encourage litigation, and the gross corruption prevalent in courts of justice, I think nine persons out of ten will consider that an English mine is a preferable investment.

Again, an English mine has so small a capital that, when successful, it is a prize indeed, the shares advancing to a price many times exceeding the original outlay. Every investor has the chance of making a fortune. But there are equal, or nearly equal, chances of a total failure in an American mine, while the capital is so enormous that, even when successful, the shares are never quoted at any very high premium. I would refer to the Richmond Company as an instance of this. It seems impossible to doubt the enormous size and great richness of the ore body, yet the shares may be had for a premium of less than 2*l.* I would also refer to the very mine Mr. Longmaid has under his own superintendence as an instance of the discouraging character of American mining investments. It will cost him at least three times as much to mine, dress, and send his ore to the nearest market as it will in England, while he will realise only about one-third as much for his produce.

And now I have a word to address to Mr. Longmaid personally. I have great confidence in his experience and abilities. Indeed, if I had not I should be a

miserable creature, for I have a perilously large stake in the mine which has been committed to his management. I am unaware whether he writes frequently to his directors; but, at all events, only two letters of his have been submitted to the shareholders in four months. Perhaps they have been of too gloomy a character to be permitted to transpire at a time when the directors are trying to coax money out of our pockets. Meanwhile, however, the poor shareholders, who find their shares utterly unsaleable, and are harrassed by frequent calls, are hungering and thirsting for information. It may be necessary in a letter which the manager intends to penetrate beyond the directors to employ such expressions as "splendid property," "confident success," "easy to take out 150 tons of ore per day." But Mr. Longmaid may have recourse to them without any fear of their having an ill effect upon the shareholders, who have been surfeited with such dainties. A little dry information as to when he expects to sell any ore, and what he imagines will be his working expenses, would be very acceptable. A WAITING SHAREHOLDER.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—Notwithstanding what has been and what may be said to the contrary, I claim to have an equally just right, although withholding my name from publication, to express through the columns of the Journal my opinion as to the position and prospects of this or any other mine in which I may be interested as those of my fellow-shareholders who have the opportunity—and of which, apparently, they do not fail to avail themselves—of indulging in "tall talk" at public meetings.

I repeat the enquiries I made in my previous communication, which our jocose Chairman did *not* answer. I still say that we do *not* yet know the aggregate cost of producing and realising 1 ton of bullion, nor do we know whether any and what amount of capital is or has been expended in returning ore. If the mere cost of extracting the ore is the only outlay put against revenue—that is to say, the mere stoping operations—and that the expense of exploring the mine, and the other development charges, are charged to the debit of capital, then I say we certainly should have been informed of it. As it is, however, we have been left to conjecture.

The accounts of the Eureka Consolidated Company, however, throw material light upon the subject, and at the same time are prepared and submitted in a clear manner, each item of expenditure and income being fully detailed. In fact, these items really furnish the information I sought to obtain from the Chairman, which he regarded as absurd.

Now, what do these show? Why, a percentage of cost per ton of bullion largely in excess of what I expected to find, although I fear it must be taken as the only basis upon which we can safely calculate our own outlay, the two mines being worked under precisely the same conditions. The Richmond shareholders are told by the directors that "the total quantity of ore smelted was 18,225 tons, producing bullion of the gross value of $472,323." I find that the Eureka Mine produced from 26,155 tons of ore 3227 tons of base bullion, *the average cost of producing* 1 *ton of bullion being* 237·66, *and the transportation and refining charges* $78 *per ton*. If it take (say) 6 tons of Richmond ore ($52 per ton) to make 1 ton of bullion of the value of (say) $312, and the charges are the same as at Eureka, the cost would appear to be $315, as against a realisable value of $312. It is upon this point I seek information.—*Dec.* 2. A SHAREHOLDER.

LEGITIMATE MINING—FURZE HILL TIN MINE.

SIR,—This mine, which I called attention to about a year since, is now, after passing through many unforeseen vicissitudes—like other mines—again in full work, and destined at no distant period to be sought after by the investing public. The monthly sales of tin now being regularly made are even at the present depressed price of that metal sufficiently remunerative to enable nearly the whole of the working cost to be met, and when the turn comes—which must be soon—will leave profits. Hitherto, owing to clearing old workings and other dead work, the outlay has been very heavy, but the bulk of this work is now accomplished. There are five water-wheels erected for pumping, stamping, drawing, and driving the dressing machinery, all worked by water power, and supplied with the necessary drawing and stamping gear, and in an efficient state of working. A sixth water-wheel is on the ground ready to be placed for further stamping and drawing. The new year will see the result of this heavy outlay, for up to the present time very little dead work in the way of making discoveries has been prosecuted underground, nearly the whole of the capital raised being expended in machinery and surface work. The mine underground continues to look well, and in the course of two or three months the deepest level—the 54 fm. level from surface—will be driven under the ancient workings, where, judging from what has been done above, a good and productive lode will be found when it reaches the other side of the cross-course, which the ancients followed down from surface to below the 40. To reach this point the present company was started, and I have little doubt but what they will be well rewarded for their pluck and outlay when it is arrived at. Where will you find a mine in the two counties of Devon and Cornwall with such chances for a brilliant future, worked by water-power sufficient for all purposes, and selling at the nominal price of 7s. 6d. to 10s. per share, or 6000*l*. for the mine?

What are the mining public about that they will not eagerly seize such an opportunity for investing in a mine like this one, when they are giving high premiums for worthless concerns? Let them have the mine inspected by any respectable agent, and I am willing to abide the issue, which I predict beforehand will result in a purchase being made. But they must do so at once, or the opportunity will be lost, as the watchful ones are ready at any moment to secure all shares obtainable as soon as the before-named point is reached. EDWARD BETTELEY.

Morning News Chambers, Plymouth, Dec. 3.

FORTESCUE TIN MINING COMPANY.

SIR,—The executive of this company, and notably the managing director, have so long dwelt in the dream-land of the future that they seem, in reference to all profitable operations, studiously to ignore every other tense of the verb. In short, to drop metaphor, it has been the fate of the shareholders for many months past to be amused with flattering promises instead of performance, and they are now coolly expected to be still satisfied with this childish mode of proceeding.

It is high time, surely, for those who have a substantial stake in the company to awake out of their slumber, and to join together in some energetic action for asserting their right to know exactly how matters stand. They have the power of calling a general meeting of their co-proprietors, let them not delay to use it, and compel the directors by a moral pressure to break a silence which, if much longer maintained, cannot fail to issue in most serious damage to, if not destruction of, their property. The market for the company's shares has been so shaken and convulsed that it can scarcely be said to have an existence, and in the best view of it no sale can be effected except at a frightful sacrifice. To charge this fall on brokers and dealers as its originators is an idle suggestion, carrying on the face of it its own contradiction: and then, as a remedy for these imaginary attacks or manœuvres, to withhold the weekly reports can only be regarded as the climax of absurdity. If brokers are powerful enough to bring down quotations from above par to zero, or near upon it, the natural supposition arises that some internal mischief is at work in the undertaking itself, otherwise weekly reports would be the weapon best adapted for their discomfiture. Let shareholders, then, manfully face the difficulty, and combine in an effective endeavour to probe the sore which in some mysterious way is threatening ruin to their prospects if not promptly dealt with. Half-yearly general meetings, and a weekly publication of progress in the Mining Correspondence, are measures of indispensable importance, and if any supervision worthy the name is to be exercised by shareholders for the proper protection of their interests they should be firm in insisting upon these requirements. Seasonable checks of this kind, coupled with a rigid enquiry into the circumstances which have exercised so pernicious an influence over our property in lowering its value, may, it is hoped, prove that the evil is not past remedy: but no effort should be spared to prevent the Fortescue from becoming a bye-word in the mining interests. IOTA.

Dec. 2.

THE MOSSDALE LEAD MINING COMPANY.

SIR,—Can any of your readers give me some information about the unfortunate concern called the Mossdale Lead Mining Company? From a circular received not long ago it seems it has been decided to wind-up the company. I have tried over and over again to get some information about the company, but without success. My appeals to the secretary have not been replied to. As I wrote my last letter some months ago, it can scarcely be said he has not had time to reply. Can anyone tell me whether there ever really was such a company, or whether the whole affair has been a myth? And if it be true that such a company really did exist, I would like to know whether the directors representing such company had a right to purchase a property to start with and swallow up all the capital subscribed, knowing full well that they had not only not sufficient capital to go on with, with the least prospect of success, but not enough to make even an attempt at a beginning. In such circumstances, can the directors not be held liable to refund the few shareholders? In other words, have I no claim on the men who so coolly fooled away my money? A CONSTANT READER.

ENGLISH MINING—PRESENT AND FUTURE.

SIR,—"Where ignorance is bliss 'tis folly to be wise," and as "Observer" chuckles with such a hearty refined sublime gusto over his knowledge of the now existence of 6 ozs. silver per ton of stuff in our lodes in this district, it is almost a pity to attempt to enlighten such a happy individual who, by his own confession, can hardly tell a hawk from a handsaw; the idea of "Observer," a man without a name, a Japhet in search of a Father, rushing into print, and actually questioning the veracity of the statement made by Mr. Bawden, a well-known assayer, is beyond precedent. "Observer" simply does not understand his subject, he has no doubt one or two assay tickets in his possession, giving 2 or 3 ozs. of silver per ton, as a result of his deep researches, and because these assay products represent only 3 ozs., he would have the world believe that our lodes only contain the amount of silver set forth upon his wretched bits of paper. I have scores of them, and well know that when any assayer makes 3 ozs. there really exist 6 ozs. of silver, and am ready to prove this by demonstrative facts. I offered to do so two or three weeks since. The Wheal Barnard Works are now started, which will to a great extent solve the secret, since several assayers make 4 ozs. of the 3 per cent. burnt copper ores, whereas Capt. Knott never gets less than 10 ozs. I have seen this proved upon low class silver ore two years ago, 3 ozs. against 10 ozs., and yet with bad chloridising, imperfect workmanship, and losses upon the road by the old mercury and revolving barrel business, 6 ozs. pure silver was obtained from a ton, when assayers called the sample 3 ozs.; surely every impartial reader of your Journal must confess that I am open in my statements, and only want to get at the real truth and so do mining good. Here is Wheal Barnard, like hundreds of other mines, glutted with low class ores, but rich catches few and far between; now I propose to take out this month, at a cost of 200*l*., material by the new process that will realise 300*l*., will this be a success or a failure, or will it be "bunkum?" I pause for a reply, this is merely a starting point under difficulties, with half the works in the open air, although heat is the great desideratum. I do not complain of having to make bricks without straw, having long since got inured to such minor difficulties, and the building of Rome occupied more than one day. The 1st of next month I will give a detailed account of what has been accomplished in December, and full expenses and sales, and if it costs 200*l*. to return 150*l*., the truth will be told every whit as much as if a large profit is made. I anticipate that a cost of 200*l*. will realise 400*l*., but am determined to be under rather than over the mark—say, then, from 300*l*. to 200*l*., and from material which without the new process had better be left underground. Again, taking the figures of 300*l*. return for 200*l*. cost, ten years since the 300*l*. would have been 400*l*. by the higher price of copper, and the 200*l*. transported into 150*l*. by the lower cost of coals, salt, &c.; and these days may come again, for copper cannot possibly go much lower. If you want a good simile, it is like Barnard in the Social Mining Scale—there is much room for improvement, and coals and other expenses are sure to have a drop before many months have passed. Not Barnard; a drop for him is impossible, since his present perilous leap for life takes place from the lowest round of the ladder. Courage, my friends, never mind the bunkum. Courage I say, the string of mining speculation will now soon be drawn, and the representatives of the noble pursuit who have undeniably lately been in close proximity to all the unfavourable advantages of a bee's nest, will find their pains and sores converted into joys and comforts by a special change of programme, in which will be allotted to them the more palatable task of sipping the sweets of honey.

4, *Abbey Mount, Tavistock, Dec.* 3. THOS. J. BARNARD.

BRYNN MINE.

SIR,—Some time ago you used to publish weekly reports of the great discoveries of tin made in this mine, and in such quantities that one would have thought that a much greater depression in the tin trade would have been experienced than its present state. Reports went to state that a great landslip took place one night, and opened a lode with unbounded wealth, and reports were sent forth week after week in reference to this great lode of wealth, and that the stamps was working; when, after many months of such promises, the captain was asked to make a sale of tin, which he did, and, to the surprise of all the directors, whom we know to be of the highest respectability, after reading such glaring reports, the sale of tin was only a few cwts., perhaps 10 cwts.

In consequence of the reports the shares rose from 20s. to 40s. each, 3000 in number; but what do the shareholders say now? We do not write this against the mine, believing, as we do, that the mine is a valuable one, but it must be managed differently, and conducted by a miner who has judgment, and knows tin dressing. If the directors had taken our advice when we were called in by them, and have acted on it, they would by this time have had a good payine mine, and we boldly say there is no other way to open and work the mine apart from our recommendation to a profitable issue. PARRYN AND CO., Mining Engineers.

St. Austell, Dec. 4.

MINING IN CARDIGANSHIRE.

SIR,—I shall be glad if you will insert that a very important improvement has taken place in the lode at Nant-yr-Crien, where there is now no doubt felt of its becoming a very profitable mine. ABSALOM FRANCIS.

[For remainder of Original Correspondence, see to-day's Journal.]

MINERAL RESOURCES OF QUEENSLAND.

The following is an extract from the Colonial Treasurer's Budget Speech in the Queensland Legislative Assembly, delivered in Brisbane on June 19:—

Since the tin discoveries in Queensland* there have been 1168 selections, of which about 1100, representing 105,000 acres, have been approved, and the remainder either under consideration or rejected. There have been also in 1872 and 1873, 1130 applications for other mineral selections (principally copper), of which about two-thirds, representing 55,000 acres, have been approved, and the remainder either rejected or not yet reported on by the Commissioners. It is assumed that the balances of the greater portion of the early tin selections will be paid; and that of the late selections, which are principally of less valuable country, only about 60 per cent. will be paid up. The balances of purchase-money being payable within 12 months from the date of approval, most of the payments will be due this year, so that I have estimated 35,000*l*. for mineral selections of all kinds for 1873, and 25,000*l*. in 1874; of this 60,000*l*. 40,000*l*. will be due to the tin, and the balance to other minerals lands. The gold duty I have already states ceases with the present year. It is now 1s. per ounce, and from the 1st of next month will be 6d. It is not improbable, therefore, that gold is now being held over in order that the reduced duty only may be paid on exportation. Notwithstanding this, however, it is satisfactory to find that the quantity of gold passed through the Customs between January and May of the present is considerably in excess of the same period of last year, being 87,815 ozs. against 74,247 ozs. in 1872. We are now exporting at the rate of 210,000 ozs. annually—equal to about 750,000*l*.—and I have little doubt that the value of the gold actually exported during 1873 will be nearer a million sterling than the sum named, for the production is greatly on the increase. The gold exported this year has been shipped from the following ports:—

From Maryborough ..... Ozs.	24,937
,, Townsville	39,916
,, Cardwell	17,191
,, Rockhampton	3,812
,, Other Ports	1,954

The quantity of tin exported in 1872 was 1357 tons, valued by the exporters at 119,815*l*., or 82*l*. 6s. 2d. a ton. There have been brought down by rail since the commencement of the tin discoveries in all 3945 tons, equal at the above valuation to 325,000*l*. In reference to copper, I will only mention that in 1871 there were 3028 tons exported, valued at 182,528*l*.; and in 1872 there were 3029 tons exported, valued at 257,723*l*.

* This is exclusive of the country taken up in New South Wales.

ALLEGED MINING FRAUDS.—At the Manchester Police Court, on Nov. 28, Erwin Harvey Wadge was charged with having, in 1870, by fraud and conspiracy, obtained various sums of money. Detective Inspector Shandley said the prisoner was given up to him on Thursday, in London, under a warrant charging him with having, in 1870, in connection with a man named Thomas Gibson, now serving a term of penal servitude, obtained by fraud large sums of money. In that year the prisoner and Gibson established themselves in Cooper-street, Manchester, and in London, as mining agents. They also stated that they had offices in Paris. In June, 1870, proceedings were taken against the prisoner and Gibson, and a man named Yeomans, and they were committed for trial at the Assizes, but the prisoner absconded, and warrant was issued against him. Gibson was sentenced to five years penal servitude; Yeomans, who was found to be only a servant, was discharged. The prisoner escaped to France, and afterwards went elsewhere, but a few months ago he returned to England, and recommenced business in London and Glasgow as Henry C. Gray, mining agent. Witness told the prisoner he was taking him into custody because a true bill had been found against him for conspiracy with a man named Gibson, at the Assizes in July, 1870, and the prisoner replied that he instructed Gibson at the time to work a mine in Cornwall, known as the North Caradon Mine, and sent money from Paris, where he then was, for that purpose, and anything Gibson had done wrong was entirely apart from his (prisoner's) knowledge. The prisoner also said that he was not aware that Gibson was not following out his instructions until he heard he was arrested. Mr. Headlam committed the prisoner to the Assizes.

Thomas Gibson and Arthur Yeomans, together with the prisoner Wadge—who, however, was at that time beyond the jurisdiction of the Court—were indicted before Mr. Baron Cleasby at Salford Hundred August Assizes, 1870, for having in Manchester conspired to obtain from Mathew Horsley, shipowner, Hartlepool, an order or cheque for the payment of 200*l*., with the intent to defraud; and other counts in the indictment charged the prisoners with having by similar means obtained sums of money from other persons amounting in the aggregate to over 2000*l*. The prisoners, who occupied offices in Cooper-street, and described themselves as "Messrs. Gibson and Ware, mining agent," issued a prospectus purporting to be that of the North Caradon Mining Company, having a mine in Cornwall, which was stated to be in successful operation. The document, which bore the names of the prisoners as brokers of the company, went on to state that the scrip consisted of 7500 shares of 2*l*. each, and that there was every reason to expect immense profits to be realised. The company was alleged to be under the protection of the Stannaries Court; but the projectors of the so-called company, although they had made an application to the Duchy of Cornwall Office, in London, for a licence, and had paid the small first-instance fee, had not deposited in the Stannaries Court the needful security for surface damage and to entitle them to go upon the ground. Advertisements and glowing descriptions of the mine were published, and persons seeing these were induced to apply for shares. In communicating with these persons lithographed forms were enclosed, purporting to be reports from mining captains and surveyors employed at the mine. It was soon ascertained, however, that there was no such mine, and no such company in existence. The matter was placed in the hands of the police, and Inspector Shandley apprehended Gibson and Yeomans at the office in Cooper-street, and found there large numbers of letters, circulars, and other documents. Subsequently the same officer visited the spot in Cornwall where the North Caradon Mine was alleged to be situated, and found that it was a small piece of land attached to a farm heaped up with ferns and rubbish. Evidence was adduced to the effect that the accused had obtained large sums of money on the representations made by them, and witnesses stated the nature of the soil was entirely opposed to the successful carrying on of mining operations, and that nothing had been done there for years. For the defence it was urged that Yeomans was merely the servant of Gibson and Wadge, and was not responsible for the the part he had taken in the matter; and that Gibson, "swayed by the imaginative and clever mind of Wadge," and the experience of the starting and subsequent successful working of other mines in Cornwall, believed that the mine might be successfully worked, and only waited for capital to accumulate in order to commence operations with vigour. Yeomans was discharged; but Gibson was found guilty, and sentenced to five years penal servitude.

PRICES OF MATERIALS

As charged at the GREAT WHEAL VOR UNITED MINES during the following months:—

Description.		July 14.	Aug. 16.	Sept. 13.
Coals—common	per ton	20s	20s.	20s & 21s
,, best	,,	30s 10d	—	31s 8d
Iron—common	per cwt.	17s	—	—
,, —best	,,	19s	17s	17s
Steel—cast and blister	,,	56s	56s & 60s	60s
Nails—4, 5, and 6 in.	,,	24s	24s	24s
Tallow	,,	48s 6d	48s	48s
Grease	,,	—	—	8s
Rope	,,	42s	42s	42s
Wire rope	,,	42s	—	—
Stamps heads*	,,	—	8s 6d	—
Oil—olive	per gall.	4s 9d	—	—
Candles	per doz.	5s 6d	5s 6d	5s 6d
Hilts—pick	,,	3s 3d	—	3s 3d
Powder	per 100 lbs.	—	42s	—
Leather—butt	per lb.	2s 6d	2s 6d	2s 6d
White yarn	,,	5½	5½	5½
Hemp	,,	5d	5d	5d
Timber—Norway	per 50 ft.	47s 7d	—	47s 7d
,, pine	per foot	—	—	2s 6d
,, oak	,,	2s 6d	—	4s 6d
,, Baltic	,,	—	1s 4d	—
,, battens	,,	2½d & 2¾d	—	2¾d
,, pitch pine	,,	—	2s 9d	1s 10d
Cartridges	per 100	38s	38s	38s
Safety fuse	per coil	—	6d	6d

* Longshanks'.

Lectures at the Royal School of Mines.

ON HEAT.

In the second lecture of the course on "Heat" Prof. GUTHRIE proceeded as follows:—Last time we established the fact that, speaking generally and roughly, bodies expand by heat, and the examples we took were solids, liquids, and gases. Then we showed that solids expanded unequally by heat, some more than others; and we also took alcohol, water, and mercury as types of liquids, and found the same inequality amongst them. But when we come to gases we find that they no longer exhibit the same difference of expansion; they all expand, when equally heated, very nearly the same fraction of their volumes. To prove that, here are two equal flasks, one filled with air the other with coal gas, and tubes lead from the corks of these flasks, and terminate under these long inverted tubes filled with coloured water. We will heat them both equally by placing them to the same depth in a trough of hot water; the gases expand, bubbles pass up the tubes, and you see the quantity of water displaced from each tube is equal. Experiments of this kind accurately conducted have shown that if 1 cubic foot of hydrogen be heated from the freezing point of water to the boiling point, allowing it to expand freely under the ordinary atmospheric pressure, it will become 1·3661 cubic feet; air under the same conditions would become 1·3670, and so on with other gases. It is only when we come to gases which are more easily condensable by cold or pressure that we find any serious variating from the above law. For all practical purposes we may say that if a cubic foot of gas be heated from the freezing to the boiling point of water, it expands a certain fraction of its volume—or, in other words, if you take a fixed quantity of any gas at the freezing point, and heat it, for every degree centigrade that you heat it it will expand 1·273d part of its volume. It seems that the parts or molecules of a gas are farther apart than the molecules of a liquid or a solid, and being farther apart they are less subject to the force of cohesion, which complicates the action of heat. Glass expands when heated from 0°C. to 100°C., ·000,876 of its length and thickness; platinum, ·0008, which is very nearly the same as glass; the result is that if one wishes to fuse a metal into the glass, one can employ platinum where one could not employ silver or copper (the expansion being respectively ·001910; ·00172) apart from the oxidation they undergo. The copper or silver and glass would stick together as long as they were hot, but on being cooled they would separate from it, as they shrink in a different degree. This fact is of practical importance to the analytical chemist, who frequently has occasion to fuse platinum wires into glass. Another practical application of this inequality of expansion is of great practical importance in the construction of pendulums. Of course, the longer the pendulum is the slower it swings. Since the solid material of which the pendulum is made expands by heat in hot weather, the pendulum will swing more slowly than in cold weather. But different metals expand differently: take zinc and copper, for the same degree of heat zinc expands more quicky than copper. If, then, we take the simplest case, and imagine a bar of copper and a bar of zinc on the side of it, both being fastened together at the bottom; on being heated the copper will expand downwards, while the zinc will expand upwards, and if of proper proportional length will exactly counteract the effect of the copper in lowering the centre of gravity of the pendulum. Or, to take another case, suppose there is at the bottom of the pendulum a cross piece, formed of a compound bar of brass (below) and iron (above), with a weight at each end. As we saw last week, the effect of heat is to curve such a bar upwards, and this lifting up the weights, so that while the pendulum bar expands with heat the centre of gravity remains constant. A chronometer balance wheel may be compensated by fastening to the inner portion of the circumference a piece of zinc; the effect of heat is to expand the wheel outwards, but this piece of zinc will expand inwards. Or, again, the bob of the pendulum is sometimes formed of a glass vessel, partly filled with mercury, although the pendulum rod expands on being heated, the mercury expands upwards, and when properly proportioned the centre of oscillation remains constant. A thermometer has been constructed on the principle of the unequal expansion of alcohol and mercury; there is a glass vessel containing a quantity of mercury, into which is placed a little platinum diving bell, containing a certain quantity of alcohol, a long platinum wire reaching from the bell out of the mercury, on which the graduations are marked. When the temperature is increased the mercury and alcohol both expand, but the alcohol most rapidly, hence a certain quantity of mercury will be driven out of the bell, and the instrument will rise. By making the wire very thin, and therefore long, this is an instrument of extreme delicacy, and has the advantage over liquid thermometers in that the index is free, and can register freely in the air.

Here we have an iron bar red hot on this massive frame; through a hole in one end of it is now placed a cast-iron pin, ½ in. in diameter, resting against the two pillars of the frame. While the bar is hot, and therefore long, the other end is screwed up tight. As the hot iron cools it shrinks, and draws in the middle of the pin; the ends of the pin, however, being held tight by the pillars; you see the pin is now broken. We might also call this force of contraction an infinite force, seeing it acts through such a small space, and this great law of mechanics says that the less distance through which a force acts the greater must be the force. At the commencement of the lecture we placed some cast-iron bottles, with sides about ½ in. in thickness, and which were filled full of water, and screwed up tight by plugs in a freezing mixture. The water inside was frozen, and in freezing it expanded, and that with such a force as to shatter these bottles, as you see and heard. This thick shell was broken in the same way. There is no danger in these experiments, as it is not like an explosion of gases, where the expanding gas pursues the pieces, but here as soon as the trifling but irresistible force is gratified the iron simply starts to one side, the small projection being due to the elasticity of the iron. Other examples of this molecular strain, some exceedingly curious, present themselves to us. We may have the force locked up in the molecules for an indefinite time; here is a "tear," formed by dropping molten glass into water; the outer crust was cooled first, then the inner molecules get cool, and endeavour to contract; this they can only do in two ways, either by leaving a vacuum between themselves and the already congealed glass, or by setting up an internal strain. There is really no reason why such a vacuum should be formed in one place more than another, although it is difficult to prove that it would be so. There is the internal strain, as we shall see by rupturing one part of the structure; we break off the point, and the whole falls to powder. Such is also the case with unannealed glass; here is a small flask of unannealed glass, the particles of which exist in a state of strain, and it will break to pieces if a small scratch be made on its inner surface, as by letting a small crystal of quartz fall into it.

Liquids when they expand exert an enormous pressure, not so great, generally speaking, as solids, but sufficiently great to burst these glass tubes. These two glass tubes are very nearly full of water, and I will place them in this trough of flannel, and pour hot water over them, and you now hear them burst. This flask (fitted up like that in a former experiment to show the expansion of water) contains a mixture of ice and water; I apply heat to the flask, and you observe the expansion of the glass as before, but this time there is no reversal of the movement. When the ice melts it gets denser—that is, water is denser than the ice it forms, so that the volume of the mixed mass really decreases on heating. Water, therefore, has this property, that when solid it is lighter than the liquid; and in this respect amongst all solids and liquids known water stands, I will not say alone, but amongst a very select number of bodies. An illustration of the common behaviour of bodies is seen here in this paraffin, which on solidifying from a liquid state contracts, and leaves this hollow in its upper surfaces, and therefore solid paraffin is heavier than liquid.

Now we come to thermometers. If we take a flask with a well-fitting cork, and a narrow tube through the cork, we have all the elements of a thermometer; but we wish to prevent the evaporation of the liquid; we wish to get rid of the pressure of the atmosphere; we wish to make the liquid adhere to the sides of the tube, so as to give a clean surface as it moves. For this purpose it is found advantageous to take a liquid and free it from air, free the vessel from air, and shut it off from the influence of the atmosphere in every way. Then, by measuring the increase of volume which a certain quantity of mercury or water undergoes we have a measure of the increase of temperature. It is found best to make a great discrepancy between the size of the flask and tube, or, as generally used, bulb and stem: the latter is of capillary bore, and it is also advisable not to have the bulb too large—first, because there is less danger of its being broken; and, secondly, because a small quantity of liquid more rapidly acquires a given temperature than a larger quantity. The tube ought to be so small that when the liquid expands a thousandth of its volume the level ought to rise an appreciable height in the stem. The bulb is filled with alcohol or mercury; alcohol of low temperature is required to be measured, because it has never been frozen, whereas mercury is easily frozen, while mercury requires a high temperature to make it boil. In making the thermometer the bulb is partly filled with mercury, and then the mercury is boiled to expel the air, and when the air is expelled, and the vessel quite filled with mercury and the vapour of mercury, it is inverted into a vessel of mercury, and as the tube cools and the vapour condenses mercury will be forced into the tubes. It is allowed to cool in that position, then it is withdrawn, and heated to the highest temperature it is desired to measure with it, and while at that temperature it is sealed up (say) with wax. When again cool the tube is closed by fusing with the blow-pipe; the pressure of the air assists in the latter operation by forcing in the sides of the tube: thus we should get a thermometer. Now, to graduate it we should have to plunge it into freezing water or melting ice, and mark the height at which the mercury stands, and then plunge it into boiling water, and again mark the levels, and we have two points fixed. The temperature of melting ice or freezing water is quite constant, that of boiling water nearly so. The degrees between these fixed points are arbitrary; in the Fahrenheit scale there are 180 (the freezing point is 32°, and boiling point 212°); in the Centigrade the freezing point is 0°, and the boiling point 100°; in the Reaumur the one is 0°, the other 80°. In these lectures I shall use the Centigrade scale.

Another very important point is to ascertain at what temperature water is at its maximum density. We saw water at the ordinary temperature of the air expand on being heated, and contracting, and therefore getting heavier, as it cooled, and yet ice is lighter than water; clearly, therefore, there is a discontinuity at some point. By careful experiments it has been found that water goes on contracting as it is cooled down to 4°C., after which point, as the temperature sinks, it expands, so that at 4°C. water has its maximum density. Take the case of a pond which is freezing, and you find that the water at the surface is at the freezing point, the water at the bottom is 4° above that point—that is to say, the coldest water rises to the surface.

Heat passes through space in three ways, which can all be illustrated by a candle and ordinary pin; it travels by conduction, by convection, and by radiation. If I hold a rod of metal, such as a pin, in this candle flame, although the candle flame is still, and the metal is quite still, I feel the heat gradually creep along the wire; this is conduction. If I move the candle to another place, it is evident that I move the heat there also; this is convection, or the movement of the heat with the hot body, which can also be illustrated by the flight of a red-hot cannon ball. If I hold my hand near the candle, I feel my hand receiving a certain amount of heat; this is radiation, and this radient heat is most prominently exemplified in connection with the sun. For this latter mode of transmitting heat there is no ponderable matter required between the body emitting heat and the body which receives it. We find that solids conduct heat better than liquids, and liquids than gases; and of solid metals as a class are by far the best conductors of heat. Here is a compound rod, one end of brass the other wood; I wrap a piece of paper smoothly round the rod, and hold it at the junction of the brass and wood over a flame, and you see the paper over the wood is soon scorched, while that over the brass is unaffected. The reason is that the brass conveys away the heat so quickly that the paper is kept comparatively cool, while the wood, which is a bad conductor, conveys away the heat less rapidly, and it accumulates. The sensation of heat depends

much on the nature of the substance with which the hand is in contact. A piece of brass and a piece of wood, which have been for some time in the sun's rays, are equally heated, and give the same indications with a thermometer, but on taking hold of them by the hand, the metal will appear to be hotter than the wood. The metal being a good conductor of heat keeps up a constant stream of heat to the hand, while the wood cannot so supply itself from the neighbouring parts, and so there is not so much heat poured into the hand in the same time. For an exactly similar reason, if both substances be colder than the hand, but of the same temperature, the metal will appear the colder, because the heat going out from the hand is rapidly conducted away to other parts of the bar, whereas in the wood it is more limited. If a ring of metal be brought in contact with a flame it lowers the temperature of the gases, and extinguishes the flame. A piece of wire gauze will for the same reason prevent the extension of flame, for if a piece of gauze be held over the gas issuing from a jet, and the gas be lighted above the gauze, the flame will not spread downwards, because the temperature of the gases in contact with the gauze is too low for their combustion. The Davy lamp is constructed on this principle, it consisting principally of a cylinder of wire-gauze enclosing the light. The explosive gases burn inside the gauze, but the latter prevents the flame spreading outside the lamp.

ECONOMISING COAL—CHEAP GAS.

From the enormous efforts which have recently been made to economise coal, owing to the exorbitant price which it has been commanding in the market, we may hereafter be enabled to look back with gratification rather than regret upon the "coal famine" from which we are just recovering. The progress made in devising means for generating steam with a diminished consumption of fuel has been considerable, and from an interesting series of photometrical experiments which have been made during the past week there can be little doubt that at no distant date illuminating gas will be produced with such an exceedingly small consumption of coal that, even assuming the production to remain as at present—about 120,000,000 tons per annum, the relation between supply and demand will be very materially altered, the necessary consequence being a decline in the price of coal, which will be most advantageous to the general industries of the country. The new "super-cannel" gas, so called from the brilliancy of the light produced with it, and not from the material of which it is made, for really coal is not an essential ingredient in its manufacture, is the invention of Mr. ISHAM BAGGS; and the economic advantage which would result from its successful introduction will be readily appreciated when it is stated that the first cost of producing the gas is but 2d. per 1000 cubic feet, and that the additional outlay for giving it the desired illuminating power will not exceed from 4d. to 6d. per 1000 cubic feet more. The supercannel gas is claimed, moreover, to have the advantage of being entirely free from danger; the gas as first produced is harmless and inexplosive, and it is enriched and converted into illuminating gas with ordinary non-explosive paraffin oil, such as is daily used in the ordinary table lamp, even this being capable of substitution by the heavier oils (separated in the process of manufacturing the ordinary lamp oil), which will not burn at all, so that the most timid may use it without fear.

In the last experiments the invention was only used for enriching ordinary gas as supplied through the company's mains, and in this application, although it was estimated that the cost of enrichment was under 4d. per 1000 cubic feet, the light was shown to be improved more than 60 per cent., and at the same time to have greatly increased in purity. With regard to the production of the dark-gas, or main body of gas to which the illuminating properties are subsequently imparted, it was ascertained in some trials made at Aldershot that no less than 220,000 cubic feet were obtained from a single ton of coke, the yield of illuminating gas from the best cannel coal being only from 11,000 to 15,000 cubic feet of gas to the ton; and the manufacture of this dark gas has the great recommendation of requiring no retorts, nor any of the other costly apparatus inseparable from the manufacture of ordinary illuminating gas, and of involving a very limited amount of manual labour. The complete apparatus would cost no more than an ordinary lime-kiln, and half-a-dozen men would be enabled to manufacture a quantity of cubic feet of gas which would represent the production of a large and well-appointed gasworks, with its full staff of officers, workmen, and labourers capable of supplying a well populated town.

But it is not alone in the manufacture of gas for illuminating purposes that Mr. Baggs proposes to economise coal; he contends, and not without justification, that if gas can be produced at even 1s. per 1000 cubic feet it would, undoubtedly, be the cheapest fuel for the generation of steam, as well as for the later processes in the manufacture of iron, that could be used. The cost of his gas, however, would probably not reach one-fourth of the sum fixed, as the limit for it is observed that it is in the dark gas that the greater proportion of the heating properties are contained, so that for use in the generation of steam, or manufacture of iron, its conversion into illuminating gas would be unnecessary, whence the expense of such conversion would be entirely avoided. The successful development of Mr. Baggs's invention would be of such paramount advantages to all branches of industry, by giving them the benefit of cheap coal, cheap iron, and cheap light that he is certainly entitled to the best wishes of all, and the results obtained in its practical application will from time to time be fully reported.

THE MUNICIPAL TRUST.

In his exhaustive treatise on the (American) Law of Municipal Bonds, just completed by Mr. William N. Coler, counsellor-at-law, a considerable amount of information is given, which at the present moment, when the MUNICIPAL TRUST is inviting subscriptions for 1,000,000*l.* for investment in those securities, will be particularly interesting. Mr. Coler remarks that the advantage and demand for the use of commercial paper in transacting the commercial business of the world has made the law-merchant a fixed rule determining the liabilities and rights of each and all parties under and by virtue of known precedents. And with the advance and increase of commercial intercourse many of the States have passed laws making warehouse and shipping receipts subject to the law-merchant; while with the progress of science, and the demand for rapid transit, we have a large amount of municipal bonds issued in aid of public improvements, representing a very considerable portion of our money value in this form of securities. The bonds pass by delivery. The rights of the respective parties and the legal rights are adjudicated on the same principle as commercial paper under the law-merchant, differing only as to the right to sign, seal, and issue; the payor being the right of taxation. The right of the sovereign to subject the property within a certain territorial district to an assessment that will protect and discharge the obligation for which the bond was given in accordance with the terms of the contract between the parties. This applies to wherever legislative power may reside. And as the right of eminent domain belongs to the sovereign power, as well as the right of taxation, it may be called the right of eminent domain exercised over a territorial division to the extent of the assessment. The law of commercial paper, he continues, will apply to municipal bonds to the extent of the *bona fides* of the holder for value, the consideration, and issue. And as the payer is part of the political division of a State, and represented by the officials without any personal interest, questions arise as to the authority of such officials to create the obligation and make it a valid one. It is valid if there was authority to issue, and void if issued without authority, the authority being the sovereign power, whether delegated or reserved, wherein the requirements for the protection of all are observed within the objects for which municipalities are created.

From this it would appear that scarcely more risk attaches to the purchase of municipal bonds than to the negociating of the best class of commercial bills, whilst the bonds have the additional recommendation that the guarantee instead of being an individual firm is the real property of a municipality. The bonds of corporations and public bodies in this country—such as those of the City of London and the Metropolitan Board of Works—are very truly stated to be well known and in high favour in the market, and hence it is not unreasonable to conclude that investments in similar bonds issued by municipalities within the United States of America could readily be made with advantage to the capitalist interested in the trust. And the safety of the security will readily be understood when it is stated that in America each separate municipality raises the necessary funds for public purposes, such as improving streets and constructing roads, bridges, school houses, court houses, city halls, and markets, by the issue of bonds for fixed periods, repayable by a sinking fund, and secured upon the taxable property of the district. The municipalities are legally empowered to issue bonds to the extent of from 5 to 10 per cent. upon the assessed value of all real and personal property, which assessed value, in America, does not usually exceed one-third of the saleable value, and the municipalities are bound by law to levy taxes upon the real and personal property of the whole district for payment of the interest and principal of the bonds issued by them. But, perhaps, the best method of ascertaining the character of an investment is to observe the amount of support which it receives from local capitalists, and in this respect the American municipal bonds leave nothing to be desired; not only are they described as a favourite security for family settlements and other trusts, but the last Government report shows that the savings banks of New York State hold in the aggregate nearly 16,000,000*l.* worth of these securities, that amount representing one-fourth of their entire assets.

It is proposed to fix the capital of the present MUNICIPAL TRUST at 1,000,000*l.*, which is to be issued in A certificates of 50*l.* and 100*l.* each, with coupons attached, bearing interest at 7 per cent. per annum, payable quarterly, and each will have a B certificate attached, which practically will give the investor 50 per cent. bonus upon redemption. One-third of the original amount of capital will be redeemed by drawings, at par, out of the surplus interest and profits. With each A certificate the corresponding B certificate will be redeemed; when one-third of the A and B certificates shall have thus been paid off the securities representing the amount of the original capital will be realised and applied to the immediate redemption of the remaining A and B certificates, and the trust finally closed. As to the acquirement of the bonds, a provisional contract has been entered into, and advantage taken of the recent depressed state of the American markets, for the purchase of bonds of various municipalities at prices which will secure to the trust an average interest of at least 9½ per cent., exclusive of the profit which will be derived from the periodical payment of the bonds at par from time to time over an average period of (say) 15 years. By this contract these bonds are guaranteed to be in conformity with law, and to be subsisting debts against the several municipalities issuing the same; and further, that the entire indebtedness in no case exceeds 10 per cent. of the assessed value of the property liable for the loan. In ordinary times such securities are almost entirely absorbed in America, where the advantages they offer of high interest, combined with undoubted security, are fully understood; the present is, therefore, regarded as an exceptionally favourable opportunity for the formation of the trust. The trustees and certificate holders' committee are gentlemen of acknowledged business capacity, and the enterprise is altogether brought forward under very favourable auspices.

SAFETY FROM SHIPWRECK—LOWERING SHIPS' BOATS.

Since shipwrecks and the numerous accidents of the sea must be regarded as inevitable, the most that can be done is to be prepared for them, and thus reduce to the minimum the evils resulting from them. It is almost impossible, especially in case of shipwreck, to prevent excitement and some little confusion upon the approach of danger, and hence it frequently happens that arrangements which work perfectly well under ordinary circumstances, and when manipulated with calm judgment fail at the moment when they are most required. By far too many instances of this occur when the order is given to lower the boats, the consequence being that many lives are lost, although so far as boat room is concerned ample provision has been made to save them. Preparing the boats for lowering, particularly the first few, usually goes on pretty smoothly, but when the moment comes for entrusting them to the mercy of the waves the aspect of affairs sometimes alters materially—a davit sticks, the ropes will not run in the pulleys, the head and stern are let down so unevenly that the whole boat-load are precipitated into the sea, or the water being reached the disconnection cannot be effected with sufficient rapidity to enable the boat to get clear of the ship's side before it is caught by the following wave and disabled. For some time past considerable attention has been given to the construction of disconnecting hooks, and several have been described in the *Mining Journal* which really have nothing to be desired, but however effective these may be there still remains the danger of the boat being stove in by coming in contact with the ship's side.

It is more particulary to provide against this source of danger that the invention of Mr. MONTAGUE ALEX, of Southampton (recently patented through Mr. M. Henry, of Fleet-street), is intended, and judging from the drawings and description of the invention upon which the patent has been granted it certainly appears likely to fully accomplish the object in view; he proposes to lower the ship's boats with their crews, and by means of a readily manageable apparatus, in such a manner that it shall swing clear of the ship's side. For this purpose he uses arms and davits formed with joints, so that when the boat is lowered the upper end of the davit describes a quadrant of a circle; consequently, when the boat reaches the water it will be several feet from the ship's side, instead of, as usual, close alongside. The davits are also provided with appliances to allow of their being slewed round on their vertical axes as well as of their being raised or lowered. They are secured and held firmly in suitable position by means of suitable stops, and by connecting the chains or cables (which work the davits) to suit the circumstances the davits may be lowered from the deck or from the mast, and even from the boat by one man therein. The davits are jointed and slew in slots or recesses in the bulwarks, so that when they are not at work their lower parts are protected and stand flush with, or at least do not project, from the ship's sides. The davits work in guide arms which steady them in their descent, and also act as stops preventing them from being lowered to far. It is observed that part of the bulwark may be cut away, and a flap is thus formed of the cut portion. This flap is fitted on to the bulwarks by hinges so as to form a gangway when lowered for persons to step on to the boat from the deck. The invention will doubtless be extensively adopted.

COMBINED CRUSHER AND BUDDLE.—An improved apparatus for concentrating gold ores has been invented by Mr. Thomas Denny, of Bathurst, N.S.W.; and Mr. Barnett, the manager of the Pioneer Company, Caloola, after putting 200 tons of stuff direct from the battery through the machine, is confident that it is capable of pulverising and concentrating the crushings of six stamps heads without subjection to ripple-tables. The ore was put through the machine at the rate of "1 ton per hour;" and the tailings, when subjected to the most rigorous panning, showed no trace of gold or mercury. The improvements are claimed to be in the construction of the buddle, and in the combination of a pulveriser so constructed and attached to the buddle that the whole of the material passing through them shall, by the action of the pulveriser, be so reduced before going into the buddle that a buddle one quarter of the diameter of those now in use will be sufficient for the same quantity of material; for this reason, that the ones now in use receive the crushed material as it leaves the stamper-box. They possess no power of further reducing, but simply concentrate the coarse and imperfectly crushed quartz; consequently, a very large quantity of useless material is retained, which must be further reduced or pulverised before the gold it contains can get from it; whilst with this invention the whole of the substance treated is reduced to such a state of minute division that the whole of the precious metal and auriferous pyrites it may contain are completely released from the matrices with which it was associated before it leaves the buddle, and in passing through which a complete separation is effected. The material, as discharged under the face of the rollers, is reduced immediately, because the angles of the rollers and basin are such that no quantity of material can lodge on the basin. But should any of the material be not sufficiently reduced after the rollers having passed over it once, it is again brought up under the face of the roller by the swirl of the water, which acts more powerfully on the coarse particles than on those which are reduced to the required degree of fineness. The objections to the Chilian mill, all of which are avoided in the present invention, are due to the bottom of the pan being horizontal; it thus receives the material to be operated on in a mass, and in one spot. The quicksilver which is put in is generally ground to flour and destroyed, carrying away with it large quantities of fine gold. The wear and tear is likewise great, because the rollers are square across the face; that is to say, the two diameters are alike in both the inside and outside of the rollers, and thus when revolving, as they have to travel different distances in the same space of time, a grinding motion is the consequence, which flours the quicksilver, destroys the rollers and basin, reduces its efficient action, and vastly increases the friction and strain on the machinery, thus wasting much power. In the treatment of tailings the apparatus has given excellent results, and the Brown's Creek Freehold Company were the first to recognise its merits by giving an order for two to receive the tailings from a 20-stamp battery, equal to about 1600 tons per month.

LITHOFRACTEUR.—Messrs. KREBS, of Cologne, have patented an improved manufacture of explosive compounds. This relates to the explosive compounds known as "lithofracteur," and consists in preparing and mixing a series of ingredients so that accidental explosions are rendered impossible. The chief ingredients are nitro-glycerine and infusorial earth.

Meetings of Public Companies.

BLUE HILLS TIN MINING COMPANY.

A general meeting of shareholders was held at the offices, Austinfriars, on Thursday,—Mr. CHESTON in the chair.

Mr. HICKEY (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

A statement of accounts was submitted, which showed a debit balance of 447*l.* 9s. 5d.

The report of the agents was read as follows:—

Dec. 2.—During the past 12 weeks the whole of the drivage in the 66, east of Letcher's shaft, on Pink lode, has been through payable tin ground, worth from 8*l.* to 12*l.* per fathom; the present end continuing worth fully the latter value. This continuation of productive tin ground induced us to put up a rise or two in the midst of it, but it does not seem to hold upwards, the lode becoming small and unproductive as it gets near a gossan not far up, while the end, too, continues very wet the back is quite dry, therefore we think this level is just skimming over a profitable run of tin ground. This view seems to be corroborated, too, by the fact of there being pretty much copper in the lode for some time past, this ore being generally found overlying good deposits of tin in this district. On the Wheal Betsy lode the 13 end, east of Wheal Joy shaft, on the north section, has not as yet proved so satisfactory as we were led to expect from the tin ground found on the south section near the shaft. In the last 9 ft. drivage, however, the lode has somewhat changed its character, and yielded some capital stones of tin, but as yet there is nothing very regular about it, the end being just now in a sort of slide nearly horizontal. Most of the ground available on this lode has been set on tribute, varying from 11s. to 14s. in 1*l.* The tribute pitches, on the whole, have somewhat improved of late. You will perceive the returns of tin for the past 12 weeks have somewhat increased, while, unfortunately, the prices have again receded by about 4*l.* per ton average, so that the result is not quite so favourable as we had hoped. The mine, however, in the bottom, on the Pink lode, has not on any former occasion looked so favourable as it does at present, and our confidence in the ultimate success of the undertaking remains unshaken, but we shall undoubtedly have to get deeper to fully develope this part of the mine. According to present prospects, we hope to fully keep up to the present returns, while a very slight improvement in either quantities or prices will turn the scale on the favourable side.—S. BENNETTS, A. GRIPE.

The CHAIRMAN explained that the cost during the past twelve weeks had amounted to 1392*l.*, and the returns during the same period to 1228*l.*, showing a loss on the three months working of 163*l.* As explained in the report, although the returns showed some increase, the net result did not show any improvement, in consequence of the decline in the price of tin. The mine continued to open out most satisfactorily. The Pink lode looked most encouraging. The agent hoped to be able to keep up the present returns, so that a very slight improvement in quantity or value would soon bring the balance on the right side of the account.

Captain GLADSTONE asked the amount of tin sold during the quarter?—Mr. HICKEY said nearly 18 tons had been sold during the 12 weeks, which was an increase as compared with the previous quarter, but the average decline in price had been about 4*l.* per ton, equal to a difference on the product for the 12 weeks of 70*l.*, so that the actual working loss during that period was 100*l.* The mine was opening out very satisfactorily; the Wheal Betsy lode, which had been so productive in the adjoining mine (Penhalls), would no doubt prove to be equally so in Blue Hills. The 66 east has gone over a long run of good payable ground, and appears to be on the top of a rich deposit; the lode was intermixed with copper of the same character as the Wheal Kitty lode.

Capt. GLADSTONE asked what the decline had been in the price of tin during the past few months?—Mr. HICKEY said as compared with the price realised in April last the decline had been about 18*l.* per ton.

Upon the proposition of Captain GLADSTONE, seconded by Col. CLARKE, the accounts were passed and allowed, and with the reports were ordered to be entered on the minutes. A call of 2s. per share was made.

A vote of thanks to the Chairman and committee closed the proceedings.

EXCELSIOR TIN MINING COMPANY.

An extraordinary general meeting of shareholders was held at the offices, Gresham House, on Monday, to take into consideration the advisability of re-constituting the company under the provisions of the Companies Act, with limited liability,

Mr. MATTHEW GREENE in the chair.

The notice convening the meeting was read.

The CHAIRMAN said the desirability of the step suggested in the notice just read was fully discussed at the meeting recently held on the mine, and from a conversation he had since had with some of the principal shareholders there could be no doubt that the course now proposed would be generally approved. When mines were held by local parties, and each shareholder would attend the meetings and examine the accounts for themselves, and otherwise determine upon the financial conduct of the company, no doubt that the cost-book system was most effective; but when, as in Excelsior, the shareholders were in different parts of the country, the limitation of liability provided by the Companies Act was a desideratum, while the statute did not impose any provision destructive of the simplicity and efficiency of the Cost-Book. So far the Excelsior Mine had been worked under the Cost-Book System, and its resources had so far been developed as to render it necessary to construct suitable machinery to bring their tin ore into a merchantable condition. The mine possessed exceedingly good chances of becoming a really valuable property, but they must have the requisite appliances to work it in a proper manner. Already the holders of 8000 out of 11,000 shares had sent in their approval to the plan of re-construction, and the question now to be determined was the financial basis upon which the re-constituted company should be formed. His own idea was that there should be 18,000 shares of 30s. each, crediting each of the present shares with 10s. paid—that would leave a sum of 12,000*l.* for the further development of the property. He also thought that each call should not exceed 2s. per share.

Mr. ADAM MURRAY said he did believe that more than 5000*l.* would ever be required. There was no doubt as to the value of the property—it possessed the great champion lode in that district, the Holmbush lode, which returned such extraordinary results from surface, whereas in the Gwennap district they had to sink 40 to 50 fms. before the productive depth was reached. This Holmbush lode was one of the most important lodes in that county, yielding copper worth 10*l.* per ton, but as it approached Kit Hill it yielded tin. In Excelsior the adit had been driven 100 fathoms, and only one of the series of lodes had yet been reached; the main point would be developed by the new company. With machinery to do it with he believed 5000*l.* or 6000*l.* would be the whole amount required, because he believed they would come into large returns of tin at once. The mine unquestionably deserved an adequate capital and effective development.

The CHAIRMAN said that they had succeeded in securing the services of a very good tin miner as manager, who, after a careful examination of the property, had written the following report:—

Nov. 25.—After a careful examination of this mine, both underground and at surface, I beg to hand you the following report thereon. The sett is very extensive, being 500 fms. from east to west on the course of the lodes, and about 700 fathoms wide, is situate on the junction of killas and granite on the north side of the celebrated Kit Hill, being bounded by some of the most productive mines in the district; on the west it is bounded by the celebrated Holmbush Mine, from which very large profits were realised, the lodes of which traverse this sett for its entire length. The principal operations in the mine have been confined to the shallow workings of two of these lodes—Holmbush and Thorne lodes—from which a great deal of tin has been raised, and very extensive workings on the backs of these lodes for a considerable length by the ancients prove them to have been productive. A deep adit has been driven 135 fms. south, and intersected the Thorne lode, which is 7 ft. wide, composed of capel, quartz, and iron, and of a promising character; but nothing has been done on this lode, except its being cut through. A little further west on this lode there are extensive workings by the ancients, and also a shaft sunk recently about 10 fms., from which some tin has been raised, and by driving west on the course of this lode I have no doubt some productive and valuable ground would be laid open, and which will give from 30 to 40 fms. of backs or high ground. The south adit level has been driven south, and intersected the Holmbush lode, which is about 4 ft. wide, composed of capel, peach, quartz, and mundic, producing tin, but not to value. This lode is embedded in every congenial granite, and I think should have some further trial. Murray's shaft has been sunk 7 fms. on the Holmbush lode, and levels driven some distance east and west, which have opened up some tin ground: the lode at this point is large, and the tinstone should be carefully selected, and I should advise its being worked by tributers, if they can be had. Hitchins' shaft is sunk perpendicularly 13½ fms. from surface, and in about 17 fms. deeper sinking this shaft will take the lode. For the future development of the mine, I should advise the sinking of Hitchins' shaft, to do which it will require the aid of machinery for pumping the water, and should recommend the erection of a rotary engine, to be fixed in such a position as to command any of the lodes in the sett by means of flat-rods, also the driving of the deep adit level west on the Thorne lode, and the working on tribute of the tin ground at Murray's shaft. By carrying out these points of operation the mine will be proved to a reasonable depth, instead of digging over the surface, and, judging from the highly mineralised character of the lodes, and the highly productive district in which they are situated, I have no doubt a good and profitable mine will be laid open.—SAMUEL G. TRURAN.

The CHAIRMAN added that Capt. Giffard (of the Prince of Wales Mine) had also forwarded a report to the following effect:—

Nov. 28.—Agreeably with your request, I have inspected the above mine, and the following is my report thereon. The sett is situated in the parish of Stoke Climsland, Cornwall, on the north side of Kit Hill, surrounded by the following mines—Hingston Down Consols and Gunnislake (Clitters) on the east, the celebrated Old Redmoor and Holmbush Mines to the west, the Prince of Wales on the south-east, and New Great Consols north—and is about 500 fms. long from east to west, and 600 fms. wide, containing several east and west lodes. Two of them, known to be the main and most profitable in the Old Holmbush Mine, traversing near the junction of killas and granite, and has been worked on very extensively on the backs by the ancients. A cross-cut has been driven from the north side of the hill about 100 fathoms. The north one of the two above named lodes intersected near the junction of the killas and granite, where it is fully 6 ft. wide, composed of quartz, capel, &c. Although at this point (where cut through) it does not present a very

promising appearance, I would recommend its being driven on west, to get under the old workings at surface. In this drivage it would be intersected by two caunter branches seen in the cross-cut, which is generally regarded as a very important feature in mining: then to cross cut south to the main lode, where it would come under near where your engine-shaft is being sunk, and where the lode is very large and promising, yielding good saving work for tin near the surface, with every appearance of improving in depth. In conclusion, when taking into consideration the number of lodes traversing near the junction of killas and granite, and being so closely surrounded by the above-named and other mines which have made such large returns of minerals, I firmly believe if the set is thoroughly developed, with judicious management and strict economy, it will be found a profitable and lasting property.—JOHN GIFFORD.

The CHAIRMAN said that the recent returns would have been very much larger had it not been for the commencement of the new floors, besides which it had been thought the late management had made a mistake in calcining.

After some further discussion, it was unanimously resolved, upon the proposition of the CHAIRMAN, seconded by Col. COMYN, that the company be re-constituted under the Companies Act, with limited liability; that it be divided into 18,000 shares of 30s. each, crediting each present share with 10s. paid; and that the remaining 1*l.* per share be called up as required in calls not exceeding 2s. per share.

A vote of thanks to the Chairman closed the proceedings.

NEW NORTH VAN MINING COMPANY.

A meeting of shareholders was held at the offices, St. Helen's-place, on Nov. 29. Mr. T. C. MUNDEY in the chair.

Mr. F. R. WILSON (secretary) read the notice convening the meeting.

The report and balance-sheet were taken as read.

The CHAIRMAN having referred to the main items in the balance-sheet, stated that the mine had had but a short career. Money expended had been well laid out, as they had ascertained the true value of the various lodes which the sett contained, which it was clear did not justify them in continuing their further development. Having referred to the letter of Capt. Williams recommending to test the mine, and also to the numerous communications he received at that time from shareholders in the neighbourhood, asking to be allowed to take up their interest in the present company, he added that he also held in his hand a letter from Mr. Walter Eddy, in which he said—"I am prepared to take as many shares as I can well pay for. I have examined the ground, and have a good opinion of its prospects." He (the Chairman) merely alluded to these facts to show that the development of the property was not continued by this company without the best advice obtainable.

Mr. WILSON explained by means of a section the position of the lode explored, stating that the presence and indications of lead nearer the surface had entirely died out in depth.—The report and accounts were received and adopted.

Upon the proposition of the CHAIRMAN, seconded by Mr. R. OLIVER, it was unanimously resolved that the New North Van Mining Company (Limited) be wound-up voluntarily.

Mr. WILSON, in reply to a question, stated that at least 7500*l.* would be returned to the shareholders.

A vote of thanks to the Chairman and directors terminated the proceedings.

WHEAL VINCENT MINING COMPANY.

A special meeting of shareholders of this company was held at Golding's Hotel, Callington, on Saturday, in accordance with a resolution passed at the general meeting held on the 14th ult., for the purpose of considering the advisability of winding-up the company, selling the mine as a going concern, or of forming a company for working a mine under the Companies Act, 1862 and 1867. Mr. E. NICHOLLS, the purser, occupied the chair. It was at first proposed and seconded that the mine should be sold as a going concern as soon as possible, but before the motion was put to the meeting a great deal of discussion ensued, particularly relating to the high opinions of the mine expressed by mine agents and others who had seen the property.—Mr. COLLIVER said he was a large shareholder, and would be very sorry for such a mine as they had to be wound-up without further development. They might as well go down and stop Dolcoath and Tincroft as Vincent, and he would be willing to spend a great deal more in order to prove the mine.—The purser remarked that a great mistake was made at the commencement by raising the expectations of shareholders too high, and heading out the hope of immediate dividends. Too much tin was sold, to begin with, instead of sinking and opening up the property. If the mine were wound-up now it would be a lasting disgrace to the shareholders, and a laughing-stock for the public.—Reports from Capt. Michael Hoyas, Tembly, and Trevillion were read. They spoke in eulogistic terms of the value and character of the mine, and recommended a course to be adopted in the future working of the mine.—Mr. J. NICHOLLS said they had had a great deal of machinery to erect, and this caused a great increase to the working cost. Now, however, they had nothing to do but open up the ground and stamp the tin, and, therefore, the cost in future would not be nearly so much as it had been.—Mr. Sanders, Mr. Edgcumbe, and several others spoke favorably of the prospects of the mine.—The proposition was then put to the meeting, and unanimously negatived.—It was resolved that the company should be changed from the cost-book to a limited liability company, and to increase the capital by issuing fresh shares.

NORTH LAXEY MINING COMPANY.

At the statutory meeting, held at the offices, Austinfriars, on Monday, Mr. W. C. BULLER in the chair.

The following report was submitted:—

Mangolow, Douglas, Isle of Man, Nov. 28.—I beg leave to report that under the present company we have continued our operations to the extension of certain levels. The north shaft having been sunk to the 121, and her little driven out by the former company, we resumed, and are now driving, the cold level north and south: at starting the lode was small and poor, but in the former direction—that is northwards—it has improved, now 3 ft. wide, and worth about 1 ton of lead per fathom. In the south end the lode is still poor, but there is an object before this end. In the 110, between the two shafts, a large lode of a most promising nature was driven through, and along the bottom of the level was strongly mixed with ore. I am of opinion, therefore, that at the increased depth (the 121) a productive and valuable lode may be found. At the 110, driving north, the lode has not proved so productive as expected: it has varied in size and value very much, from 6 in. to 2 ft. wide, and in value from ½ to 1 ton of lead per fathom, but at the present moment is small and poor. We are working the following stopes:—One in the roof of the 66, worth 15 cwts. of lead per fathom, one in the side of the same level, worth 1 ton of lead per fathom; one in the side of the 84 worth 15 cwts.; and one in the 5*l.*, south of north shaft, worth 25 cwts. of lead per fathom. In the end, driving south of south shaft, and now in about 10 fms., the lode is 4 ft. wide, and is decidedly, although slowly, improving: the size of the ore speaks for itself, its composition is chiefly loose and fractured rock, with flos of quartz, which carries good stones of ore. I am of opinion that this driving will ultimately lead to good results. We have about 25 tons of lead dressed and undressed on the mine.—R. ROWE.

GREAT WHEAL VOR UNITED MINING COMPANY.

The quarterly general meeting will be held on Tuesday. The audited cash account to Oct. 31 shows a credit balance of 230*l.* 15*s.* 2*d.* This statement refers only to the audited accounts to the date given: a supplementary statement will be submitted at the general meeting showing the company's financial position up to that date. The profit and loss account for the three months ending Sept. 13 shows a loss of 439*l.* 17*s.* 6*d.* The ground sunk and driven during the three months amounted to 53 fms. 0 ft. 8 in.

SOUTH DARREN MINING COMPANY.—The adjourned half-yearly ordinary general meeting of shareholders was held at the office, 7, Austinfriars, London, on Nov. 29: Mr. William Jardine in the chair. It was resolved—"That the agent's report and the audited accounts be received and adopted, and printed and circulated among the shareholders; that Messrs. Charles Martin, William Jardine, and George Blogg be elected the directors of the company; that M. F. C. W. Brandt be re-elected auditor of the company; that this meeting is of opinion that the capital of the company should be increased to work the mine more vigorously, and the directors be and are hereby requested to call an extraordinary general meeting at an early date for the purpose of carrying out the same." A vote of thanks to the Chairman terminated the proceedings.

TRELYON CONSOLS.—At the meeting the accounts showed that the loss on the three months' working had been 52*l.* The lords continue to assist in developing by giving up the dues, and have consented to the working of the Cock-hill lode, which has not been worked on for about forty years, as permission could not be obtained from the former lords.

For remainder of Meetings see to-day's Journal.

NEW FUEL.—Mr. J. JEYES, of Plaistow, proposes to manufacture an inflammable compound, made by mixing one of the products of the distillation of coal-tar, known commercially as "salt" or creosote, with a porous or absorbent material.

STEAM BOILERS AND FURNACES.—Mr. G. R. WOOD, of the Wishaw Ironworks, has patented some improvements in steam boilers and furnaces. A long cylindrical boiler with hemispherical ends is supported in a vertical position in a tower of brickwork, and the grate or fire chamber is formed immediately below its bottom end. An inner cylindrical or slightly coned wall surrounds the boiler, enclosing a space up through which the fire gases first pass from the grate. From the top of the space short radiating flues lead the fire gases into an outer space or series of flues, and the fire gases pass down to horizontal flues formed in the bottom of the building and converging to the centre, where they communicate with a flue leading to the vent or chimney.

NEW FUEL.—Dr. LUTON, of Rheims, has patented an invention which relates to means of utilising as fuel the gases produced from the decomposition of chalk under the influence of heat, in presence of carbonaceous matter. Chalk in fragments, mingled with fragments of coal, is supplied to furnaces constructed or adapted so as to provide a great depth of the mixed fuel; or chalk in coarse powder is compounded with coal or other carbonaceous bituminous oleagenous matter into fuel blocks, which may be burnt in any furnace. The carbonic acid and vapour evolved from the chalk are in presence of the heated carbonaceous matters decomposed into carbonic oxide, hydrogen, or carburets of hydrogen, which form combustibles of great heating power.

PLASTIC CARBON.—Prof. V. Kletzinsky recommends a plastic carbon for filters, which is said to answer admirably. It is composed of coke, animal and wood charcoal, and pipe-clay. The ingredients are dried and reduced to powder, then mixed with molasses to a plastic state, baked in a muffle, soaked in dilute muriatic acid, washed, dried, and baked a second time.

The new combustible of M. Pagliari, in these times of dear coal may attract some attention. It consists of petroleum, resin, coal dust, charcoal dust, saw dust, and sulphate of lime. It is stated that the calorific power of this combustible is more than double that of coal.

THE COAL TRADE.

Mr. J. R. Scott, the Registrar of the London Coal Market, has published the following statistics of imports and exports of coal into and from the port and district of London, by sea, railway, and canal, during November, 1873:—

IMPORTS.

By sea.	Ships.	Tons.
Newcastle	202	132,719
Seaham	15	9,074
Sunderland	81	50,205
Middlesborough	2	724
Hartlepool	61	23,286
Scotch	17	6,215
Welsh	7	1,558
Yorkshire	46	9,027
Small coal and cinders	28	4,676
Total	459	237,484
Imports during Nov., 1872	447	226,413

By Railway and Canal.	Tons	c.
London and North-Western	99,363	12
Great Northern	90,047	0
Great Western	54,434	0
Midland	147,255	0
Great Eastern	66,777	5
South-Western	2,146	17
South-Eastern	1,018	3
Grand Junction Canal	904	15
Total	461,946	12
Imports during Nov., 1872	409,021	14

Comparative Statement, 1872 *and* 1873.

	Ships.	Tons.
Jan. 1 to Nov. 30, 1873	4864	2,410,636
Jan. 1 to Nov. 30, 1872	4480	2,315,845
Increase in the present year	384	94,791

	Tons.	c.
Jan. 1 to Nov. 30, 1873	4,692,454	0
Jan. 1 to Nov. 30, 1872	4,591,734	0
Increase in the present year	100,720	0

EXPORTS.

Export List, showing the distribution of coal imported into the port or district of London, by sea, rail, and canal, and afterwards exported coastwise or to foreign parts, or sent beyond limits of London district, by rail or inland navigation, during Nov., 1873—

Railway-borne coal passing "in transitu" through district	Tons	70,372
Sea-borne coal exported to British possessions, or to foreign parts, or to the coast	59,278	
Ditto, sent beyond limits by railway	8,495	
Ditto, by canal and inland navigation	1,761	=69,534
Railway-borne coal exported to British possessions, or to foreign parts, or the coast	27,687	
Ditto, by canal and inland navigation	584	=28,271
Total quantity of coal conveyed beyond limits of coal duty district during November, 1873		159,177
Ditto, during November, 1872		139,980
Increase in the present year		36,899

Comparative Statement, 1872 and 1873.

Total distribution of coal from Jan. 1 to Nov. 30, 1873		1,581,912
Total distribution of coal from Jan. 1 to Nov. 30, 1872		1,495,013
Increase in the present year		86,899

General Statement, 1872 *and* 1873.

Increase in coal imported by sea during the present year	Tons	94,791
Increase in importation by railway		100,720=195,511
Deduct increase of coal exported		86,899
Total increase in trade within London district during present year		108,612

THE TIN TRADE.

Tin has been heavy this month, the stringency in the Money Market acting injuriously on the article, and prices have declined about 5*l.* According to advices from Banca a reduced production of tin was expected this year, in consequence of the continuance of excessive drought. The Dutch Trading Company's second autumn sale, announced on November 4, took place on Nov. 27, when 29,993 slabs Banca were sold from 66½*l.* to 68*l.*, average 67·45*l.* Next sale will probably be held towards the end of January. Banca has been in poor request, and gradually receded from 71*l.* to 68·5*l.* Billiton was difficult to sale, but holders have evinced no pressure to sell. On Dec. 17 a public sale, comprising 3000 peculs Billiton, will take place at Batavia. The position of Banca Tin in Holland, on Nov. 29, according to the official returns published by the Dutch Trading Company, was—

	1873.	1872.	1871.
Import in November	Slabs 14,254	21,706	5,960
Total eleven months	180,540	121,912	113,912
Deliveries in November	7,882	6,060	20,017
Total eleven months	121,570	94,327	183,088
Stock second-hand	15,093	19,052	51,000
Unsold stock	110,842	54,481	27,932
Total stock	155,935	93,483	79,832
Afloat	Peculs 8,507	20,400	5,000
Shipment of Billiton—			
Import in November	Slabs 1,800	100	6,700
Total eleven months	64,700	60,974	45,895
Deliveries in November	1,200	6,544	5,000
Total eleven months	61,200	54,029	45,650
Stock	14,253	11,073	1,756
Afloat	Peculs 4,767	5,047	1,183
Quotation Banca	68 fl.	87 fl.	84½ fl.
Nov. 29 Billiton	67½	83	87½

These combined returns of Banca and Billiton, compared with those for 1872, exhibit—a decrease of the import for November of 182 tons; an increase of the import for the eleven months of 2258 tons; a decrease of the deliveries for November of 110 tons; an increase of the deliveries for the eleven months of 1172 tons; an increase of the stock second-hand of 413 tons; an increase of the unsold stock of 1763 tons; an increase of the total stock of 2176 tons; a decline of the quotation of Banca of 3½ 13*s.* per ton. The Government Returns for Sept. are—

EXPORT OF TIN FROM HOLLAND.

	September.			Nine months.		
	1873.	1872.	1871.	1873.	1872.	1871.
Germany Tons	161	153	131	2196	1340	2196
England	13	84	26	1129	221	941
Belgium	72	59	71	779	888	721
France	45	15	26	399	129	501
Hamburg	10	41	20	205	283	139
United States	—	—	—	—	—	3
Other countries	11	51	49	187	219	377
Total	312	403	326	4855	3660	4921

Rotterdam, Nov. 29. VAN HOUTEN AND EBELING.

THE COPPER TRADE.

As regards price the market is in the same position as in the commencement of November, indeed since August there has been but very slight change; for about two days in the middle of November, whilst the future of money was in so much doubt, Chili bars stood at 80*l.* per ton, and Australian sorts in proportion, but English copper did not change in value, and special sorts were not depreciated. As regards statistics, stocks on the spot have increased in the month about 500 tons, afloat and chartered of all sorts about the same quantity, but excluding Australian afloat the increase given in our usual statistics is about 900 tons. The West Coast charters for the ten months are 2300 tons less than for the corresponding ten months of 1872. The decrease in the shipments to the middle of October is 4400 tons; the estimated stock on the Coast still remains unexplained; to arrive, however, at the position of Chili copper, it is safer now to rely upon actual shipments, and as so much, too, comes by steam, it is a more reliable source of calculation than any estimate of stock. The imports and exports into and from England still show a remarkable state of the trade; the former are now 95·3 tons less than in the ten months of 1872, whilst the exports are greater than at any time in the last four years, the increase over 1872 being 9275 tons. The demand without being excessive is steady from all sides, the manufacturing trade, both here and on the Continent, being in a sound and healthy condition. The export demand has rather increased than fallen off, both for copper and yellow metal, more especially to the East. Excepting from unforseen circumstances the present price of copper may be looked upon as about its normal value, taking present supplies into account, more especially as the price has, with two exceptions only, hardly varied to any extent throughout the past twelve months.

The imports of copper into England for the first ten months of the following years were—1870, 55,496 tons; 1871, 54,501 tons; 1872, 67,903 tons; 1873, 58,570 tons. The exports for the same periods were—1870, 45,868 tons; 1871, 44,532 tons; 1872, 56,293 tons; 1873, 45,768 tons.

The position from Dec. 1, 1872, to Dec. 1, 1873, was as follows:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1872—December 1	£ 85 0 0	Tons 39,751	Tons 40,453
1873—January 1	90 0 0	32,091	41,991
February 1	87 0 0	32,432	42,012
March 1	85 0 0	32,113	41,663
April 1	92 0 0	29,296	39,275
May 1	88 0 0	29,908	39,024
June 1	84 0 0	30,912	38,984
July 1	80 0 0	30,634	39,456
August 1	81 0 0	31,697	39,279
September 1	84 0 0	29,983	37,321
October 1	82 0 0	28,657	35,405
November 1	83 0 0	28,045	34,657
December 1	83 0 0	29,141	35,526

And the comparative positions at the same date of the past four years with the present are as follow:—

	Price.	Stock on hand.	Stock, including afloat and chartered.
1869—December 1	£ 67 0 0	Tons 32,397	Tons 44,999
1870—December 1	63 0 0	35,417	45,063
1871—December 1	75 0 0	19,397	29,957
1872—December 1	85 0 0	39,753	40,453
1873—December 1	83 0 0	29,141	35,526

Leadenhall-street, London, Dec. 5. HENRY ROGERS, SONS, AND CO.

At the Swansea Ticketing, on Tuesday, 1714 tons ore, averaging 15 per cent., fetched an average price of 15*s.* 1*d.* per unit; Cape ore, of high produce, realised 16*s.* 5*d.* per unit. Bars receded during the week about 20*s.* per ton, and now stand about 9 per cent. lower than they did at the commencement of the year, although the figures in the "gross totals" show a falling off of 6241 tons, equal to about 14 per cent. reduction. The transactions for the past seven days amount in all to 1230 tons, of which 125 Lota, at 83*l.* and 82*l.* 10*s.* cash; 75 at 84*l.* 10*s.*, with three months' prompt; 1000 Urmeneta and good ordinary brands at same figures for cash, and from 83*l.* down to 84*l.* with various extended prompts; only 30 tons picked marks were sold, and realised 85*l.*, cash terms. In the French market about 900 tons (direct import), picked and best brands sold at 225 francs (equal to 88*l.* per ton), which price, after allowing for duty and carriage, is equivalent to about 85*l.* 10*s.*, Liverpool. At the close, quotations here show an advance of about 10*s.* per ton from the lowest point. In Australian we note but 315 tons, and of these 215 were Wallaroo, at 94*l.* down to 93*l.* cash; 100 Burra at 91*l.* 15*s.* and 92*l.* cash. English sorts are unaltered, and smelters tolerably full of orders. At our lowest quotations there are buyers of raw descriptions for forward delivery, but makers ask 1*l.* to 2*l.* per ton more. The following are the Government returns for this year as compared with 1872 and 1871; and in order to show the quantity of metal imported, ore has been reduced as containing 15 per cent., and regulus 50 per cent. of pure copper.

	1st January to 31st October.		
IMPORTS.	1873.	1872.	1871.
Copper in ore Tons	6,861	5,414	5,959
Ditto in regulus	11,980	12,708	12,217
Ditto in bars, cakes, ingots, &c.	28,164	38,089	26,347
	47,005	56,211	44,494
EXPORTS.			
Foreign copper	17,611	9,628	14,249
Raw English ditto	11,336	11,746	11,438
Manufactured ditto	8,562	7,727	10,077
Yellow metal	9,428	8,410	10,834
Brass	3,203	2,863	3,024
	50,140	40,374	49,622

The following were the stocks (estimated in pure copper) in the ports named, also the quantity of Chili chartered and afloat for same:—

		1873.		Dec. 1.		
Liverpool and Swansea.	Chili—in ore, regulus, Jan. 1.	Nov. 1.	1873.	1872.	1871.	
	and barilla Tons	1,187	4,857	3,177	1,566	2,517
	Chili—in barand ingot	22,366	17,467	18,728	21,688	10,489
London	Foreign copper, chiefly Australian	7,462	5,375	5,622	7,028	2,709
	English copper	398	176	152	345	567
Havre.	Chili bar and Barilla	688	1,930	1,820	216	3,440
	Other foreign	650	375	200	700	880
Actual stocks		32,751	30,160	29,699	31,543	20,602
Chili, chartered and afloat		9,574	5,992	6,385	9,414	9,758
Gross total		42,325	36,152	36,084	40,957	30,460
Stock in Chili, including 1 month's estimated make		4,250	6,000	unknown	3,759	9,500

The following were the imports—Jan. 1 to Nov. 30:—

	1873.	1872.	1871.
West Coast copper into England and France Tons	38,403	41,677	34,073
Other foreign into London	11,901	16,706	8,928
Total	50,304	58,363	42,703
November—West Coast Copper	4,655	5,006	4,486
Other Foreign	1,059	2,131	993

The following were the deliveries from stock in England and France:—Jan. 1 to Nov. 30 Tons 53,256 | 46,129 | 58,823
During November | 5,575 | 3,826 | 10,581

The direct imports from the West Coast of South America into England during the month of November were equal to 3958 tons pure; into Havre 116; and during the same period 1059 tons of other foreign copper entered the port of London, making together a total of 5114 tons. The mails received here from Chili during November advised charters for together 4802 tons, against 3752 tons during November, 1872, and 1232 in November, 1871. During the present year 58,153 tons have been so advised, against 40,570 tons in 1872, and 35,810 tons in 1871.

10, *Austinfriars, Dec. 5.* JAMES AND SHAKESPEARE.

Arrivals at Liverpool during the fortnight of West Coast, S.A., produce:—Austrian, from Baltimore, 158 tons bars; Cuzco, from Valparaiso, 50 tons bars; Marian, from Valparaiso, 96 tons bars; Araucania, from Valparaiso, 40 tons bars, 70 tons ingots, 70 tons Barilla; Tropic, from Valparaiso, 400 tons bars; Lusitania, from Valparaiso, 480 tons bars, 135 tons ingots. At Swansea, Husso, from Huasco, 23 tons ores, 570 tons regulus; Hondeklip, from Pena Blanca, 420 tons regulus; Atossa, from Pan de Azucar, 305 tons ores, 355 tons regulus.

Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—

	Ores.	Regulus.	Bars.	Ingots.	Barilla.
Liverpool	1493	1250	15,427	527	70
Swansea	2750	4229	2,724	50	—
Total	4193	5479	18,151	577	70

Representing about 22,100 tons fine copper, against 24,400 tons Nov. 30, 1872; 12,800 tons Nov. 30, 1871; 23,900 tons Nov. 30, 1870. J. PITCAIRN CAMPBELL & CO.

CORNISH PUMPING ENGINES.—The number of pumping-engines reported for October is 19. They have consumed 1861 tons of coal, and lifted 127 million tons of water 10 fms. high. The average duty of the whole is, therefore, 46,100,000 lbs., lifted 1 ft. high, by the consumption of 112 lbs. of coal. The following engines have exceeded the average duty:—

Cremyer and Wheal Abraham—Sturt's 90 in. Millions	57·4
Ditto —Willyams's 70 in.	55·3
Dolcoath—85 in.	57·5
West Basset—Grenville's 70 in.	59·9
ditto —Thomas's 60 in.	59·8
West Wheal Seton—Harvey's 85 in.	59·1

BEDFORD UNITED.—The secretary has issued a strongly-worded manifesto in reference to an application to the Duke of Bedford for remission of dues. It appears that the dues paid to his Grace are 1-15th on all ores raised, a rate which the secretary considers is in the present times most exorbitant. Its application was, therefore, made for a remission—or, at all events, a reduction—of the dues, through the Duke's agent at Tavistock, who replied that his Grace, after due consideration, was unable to consent to a remission of the dues. Mr. Laws expresses the disappointment such a communication has caused among those shareholders who have for years borne the principal part of the outlay in developing his Grace's property, and as the amount paid to him since 1865, when the dividends ceased, is about 5 per cent. on the total expenditure, independent of a heavy charge for land damage, the shareholders feel they have not received the consideration they are justly entitled to.

CORNISH MINE SHARE MARKET.—Rather less business than usual has been transacted during the week, and, on the whole, the share market has been inactive, although prices of most mines have continued firm. The "settling" occupied from Friday until Tuesday, being an unusually heavy one this time; and, besides this, we have arrived at that time of the year when share dealing, like most other businesses, is very quiet, and we cannot, therefore, expect to see any great change until the new year sets in. We have not heard of any important changes in any mines, nor fluctuations in prices. Dolcoath, Tincroft, and Cook's Kitchen shares have received principal attention, although transactions in these even have been comparatively rare. The Banca sale of tin may be said to have come off better than was anticipated; and, although the Cornish smelters met on Monday, no change was announced in the standards, and now tin-plates are quoted at higher prices, with an increased demand; so that probably we shall see better prices for tin ere long, and certainly it is wanted badly enough. Mines that can manage to pull through these depressed times will be, it is to be presumed, well rewarded when "the better day" comes. By the bye, it would seem that mine agents are directing special attention to the Red River question just now, and apparently are making every effort to lessen the quantity of tin sent down therein; for, instead of hearing of the streamers realising handsome profits, and well lining their pockets, the tables seem to be quite turned, and it seems to be the exception when they can meet their expenses. We hear that there are about 22 companies now on the Red River, and it is estimated that on an average each party has spent at least 4000*l.* for machinery, engines, &c (whilst, of course, some have laid out considerably more than that amount), representing altogether a sum of about 90,000*l.* After all this expenditure, we hear on good authority that there are only about five out of the 22 who manage to make the thing do. Wages are being cut, and still there is a woful tale of heavy loss. With regard to mine accounts, we think it high time that something should be done in order that they might be laid before the adventurers in some uniform and intelligible way. Mr. Laws complains—and very justly, too—about Carn Brea accounts—meeting Oct. 31; costs charged to June only; credits up to day of meeting; no ledger balances published—the result is mistrust, and an utter indisposition to invest. Take, again, Botallack accounts, as complained of by another correspondent, and those, also, of Wheal Basset, lately animadverted on. Why should not some clear understanding be come to as to how mining accounts should be rendered? The late Stannary Act clearly did not intend that matters should be carried on in such a slip slop manner as at present. The following are the closing quotations:—Carn Brea, 57½ to 58½; a few shares have changed hands. Cook's Kitchen shares have been fairly dealt in, at 11½ to 12. A moderate business has been done in Dolcoath shares, at 47½ to 48¼. East Basset, 13 to 14. East Pool, shares not much dealt in, at 7½ to 7¾. East Lovell, 10¼ to 11½, and quiet. Great Wheal Vor shares in fair demand, at 3¼ to 3½. North Roskear, called 3 to 4, but no transactions reported. Penstruthal, 20*s.* to 22*s.*, but rather quiet. Providence shares in better demand, and scarce, at 7½ to 8½. Rosewall Hill, 18*s.* to 20*s.*, but not much doing. South Condurrow, 4¾ to 5½, and steady. South Crofty shares are a little firmer, at 27 to 29. South Dolcoath, 3 to 4; South Frances, 9 to 10. St. Ives Consols, 6 to 7, but quiet. Tincroft, 39 to 40; a moderate business transacted. Unity Wood, 14*s.* to 16*s.* West Basset, 8½ to 9; a few shares have changed hands. West Chiverton, 5 to 5¼. West Frances, 8¾ to 9¼, but rather quiet. West Seton shares have declined to 39, 41. West Tolgus, 27 to 29; a moderate business. Wheal Basset shares, which a few months ago were as high as 60, are now quoted 20 to 22. Wheal Jane, 2¼ to 2¾; Wheal Seton, 21 to 23; Wheal Uny, 2½ to 2¾. South Carn Brea, 3¼ to 3½—moderately dealt in.—*West Briton.*

LONDON GENERAL OMNIBUS COMPANY.—Traffic receipts for the week ending Nov. 30, 9334*l.* 9*s.* 2*d.*

"BIDE YOUR TIME WITHOUT ANXIETY."—Changes of temperature prevalent in autumn frequently upset persons who are most cautious of their health and most particular in their diet. Holloway's corrective, purifying, and gently aperient pills are the best remedy for all defective action of the digestive organs. They augment the appetite, strengthen the stomach, correct biliousness, and carry off all that is noxious from the system. Holloway's pills are composed of rare balsamic matter, and on that account are particularly well adapted for the young, delicate, and aged. The field of beneficial work done by Holloway's well known and widely appreciated pills is too large for any attempt to catalogue all the diseases and distempers remediable by them.

FOREIGN MINING AND METALLURGY.

There has been no great amount of business passing in copper at Havre, but business has exhibited rather less feebleness. The markets regulating the copper trade present generally little interest. At Paris, Chilian in bars has made 87*l.*; ditto in ingots, 93*l.*; tough English, 94*l.* 10*s.*; and Corocoro minerals, 91*l.* per ton, delivered at Havre. Copper has been somewhat weaker at Marseilles, but rather from absence of business than from any other cause. Taken as a whole, the German copper markets have exhibited little firmness. There has been little change in tin at Paris; Banca, delivered at Havre or Paris, has made 127*l.*; Straits ditto, 126*l.*; and English, delivered at Havre or Rouen, 126*l.* per ton. There has not been much passing in tin upon the Dutch markets. At Amsterdam, Banca has brought of late 67½ fls. At the recent periodical sale of the Dutch Society of Commerce 29,923 blocks of Banca were disposed of at from 66½ fls. to 68 fls., giving an average of 67·45 fls. The demand for tin has exhibited no great activity in Germany. Lead has been rather drooping at Paris; French, Spanish, Belgian, and German have brought 24*l.* per ton. At Havre the lead trade has rather revived, the sale being noted of 150 tons of soft Spanish, for future delivery, at 23*l.* 12*s.* per ton. At Rotterdam lead has remained without change. In Germany the article has been firm, but transactions have not presented much importance. There has been scarcely any change in zinc at Paris; zinc from all sources has made 27*l.* 18*s.* per ton. At Marseilles, Vieille Montagne zinc has made 34*l.* 8*s.* per ton, with a discount of 3 per cent.

The business passing during the week in the French iron trade has not been of much importance. The market remains heavy, and without animation, and prices have been to a great extent nominal. It is well nigh impossible for trade committees in the present condition of industry to establish quotations founded on sales likely to form a reliable guide. This is shown by the last circular of the Syndicate of Forgemasters of the Besançon Committee, as well as by information which reaches us from other sources. The works of the Nord—although their proprietors are far from being satisfied with the state of affairs—have sufficient employment to enable them to maintain their furnaces in blast; and it is expected that the total production of this district this year will not be inferior to that of '72. Merchants' iron has been dealt in there at 10*l.* 16*s.* to 11*l.* 4*s.* per ton. At St. Dizier, where business has been extremely dull, pallel coke-made No. 1 iron has brought 7*l.* to 7*l.* 4*s.* per ton; iron from charcoal-made pig, 12*l.* 12*s.* to 12*l.* 16*s.* per ton; plates, 16*l.* to 17*l.* 4*s.* per ton; and coke-made pig, 4*l.* 10*s.* 6*d.* to 4*l.* 12*s.* per ton.

The Châtelet (Belgian) Rolling Mills Company has just held its annual general meeting. The balance-sheet, brought down to June 30, '73, showed a net profit of 12,614*l.* Out of this balance of profit a dividend of 2*l.* 2*s.* 5*d.* per share will be distributed among the shareholders. The reserve fund stands at 2795*l.* The turn over of the company for the past financial year was 155,744*l.* At a recent adjudication held by the North Belgian the highest price offered for old rails was 5*l.* 3*s.* 4*d.* per ton, and the lowest tender for the exchange (old *materiel* against new *matériel* was 1¾ ton of old rails for 1 ton of new rails of the Vignoles type. These terms were regarded as rather anomalous, as the rolling-mills want work, and the transformation of pig into iron yields just now but little profit. Forgemasters probably prefer re-manufacture to direct manufacture. It should be remarked, in considering the question, that the old rails proposed to be dealt with will not be made available for treatment all at once, but that they will be withdrawn from their present position about Feb. 16, May 15, Aug. 15, and Nov. 15, 1874. The Belgian iron trade remains generally in a languishing condition. Some contracts for rails have, however, been concluded during the last few days at satisfactory prices, and there has also been some demand for plant. Pig and merchants' iron have still been neglected, but this state of affairs will probably experience a change, as the warehouses are almost empty, and consumers must probably shortly begin to purchase more freely.

The continued feebleness in coal in Belgium, notwithstanding the new turn which political affairs have taken in France, prolongs the hesitation of purchasers and forces on concessions. Coalowners contend that the causes for any sensible reduction in prices are passing away; nevertheless, affairs do not revive, and the necessity of reducing prices, so as to prevent an accumulation of stocks, appears to be every day more urgent. Even domestic qualities, although now the most sought after, do not maintain their prices so firmly as some persons desire to have believed, and serious reductions are made in connection with many contracts. The production is considerably slackened, and in consequence of this slackening stocks are not so considerable as they otherwise might be; nevertheless, they are increasing with a rapidity which is not at all reassuring to coalowners. In the Liége district the coal trade has not experienced such change. It appears to be considered that next spring a medium price will be established about half-way between the quotations of 1870 and those of 1872, and coalowners are shaping their course accordingly, and abandoning the firm tone which they had assumed. Many colliery proprietors would now do business at between 18*s.* 6*d.* and 20*s.* per ton for contracts for long terms. A large contract is stated to have been entered into with one of the principal consumers of the Charleroi basin at 18*s.* 9*d.* per ton. At the same time it must be remarked that the extraction is declining in the Liége basin, while stocks are not very considerable. Coke, which is declining, is now quoted at about 1*l.* 8*s.* per ton. Some coke-furnaces have been blown out.

We have little news to communicate this week with respect to the French coal trade, business having displayed the same tendencies. There can now be no illusions as to the downward tendency of prices; coalowners are now making all possible concessions in order to secure business. In the department of the Nord small transactions cannot be carried through upon much lower terms, but in all important affairs reductions ranging between 1*s.* 8*d.* and 3*s.* 4*d.* per ton would be obtained. Colliery owners who had hitherto maintained prices with the most firmness have been forced to follow the general movement. The downward tendency in affairs is stated to have been accelerated by numerous offers of coal having been made by the Charleroi coal merchants upon the Lille market. Upon the Paris market business has continued extremely quiet; fresh arrivals are not disposed of very readily, and this circumstance occasions some uneasiness to speculators. It is not at all impossible that the fall which has already taken place in coal quotations may go still further. The consumption of all-coming qualities is very restricted, and rather numerous offers have been made at 1*l.* per ton. The exceptional mildness of the last few days has naturally facilitated the downward movement in household qualities, as it has rendered the requirements of consumers less urgent; and has, by consequence, encouraged intending purchasers to pursue an extremely prudent course. Coke is feeble, and has been dealt in at very variable prices. The Bouches-du-Rhone Collieries Company will pay, Dec. 1, a dividend of 12*s.* per share for 1872.

COPPER SMELTING IN CHILI.—The following particulars respecting Guayacan, in Chili, the largest copper smelting establishment in the world, will be interesting in England. The trade of Guayacan is confined exclusively to the operations of the firm of Urmeneta and Errazuriz, Chilian copper smelters. At these works about 30 or 35 furnaces of all kinds are kept running, employing about 300 hands (of whom from 40 to 50 are Englishmen), and producing annually from 8000 to 10,000 tons of copper, destined almost exclusively for the English market. The ores smelted are received both by sea and land from various mining districts in Chili, and the fuel consumed in the process of smelting is principally Chilian coal, from the mines of Lota and the coast of Arancania, a small amount of British coal being also used. During 1872 about 4000 tons of English coal were imported, while about 40,000 tons of Chilian coal were received. During the same period about 8300 tons of copper were shipped to England by the steamers of the Pacific Steam Navigation Company. During 1872 about 14,000 tons of copper ores and regulus entered the port of Guayacan, carried almost exclusively by sailing vessels belonging to the Chilian copper smelters, none of which vessels carry the English flag. The little British colony of workmen established in this part enjoy, on the whole, exceptional advantages. They are lodged in excellent houses, and receive from 12*l.* to 30*l.* per month, according to their skill, with coal and medical attendance, &c. There is a great dearth of hands in the province. The Panulcillo, an English limited liability company, have works in the interior of this province (Coquimbo), and employ about 900 hands. Their annual production of copper ores is stated to be 40,000 tons of 5 per cent., while the coal consumed is over 10,000 tons. The La Campana is another establishment in this province, where the quantity of copper in bars produced annually is about 1000 tons, and the quantity of coal consumed over 2000 tons. According to official statistics we learn further that the total exports of copper from Chili during the year 1872 were 45,500 tons, and from Bolivia 1003 tons. The amount of coal exported from England to Chili from Jan. 1 to Oct. 31, 1872, was no less than 178,893 tons, thus showing how large are the coal exports from this country to the Republic of Chili.

AMERICAN MINES—MARVELLOUS YIELD OF PRECIOUS METALS.

In 1848, the year in which gold was first discovered in California, the production was estimated at $3,000,000. In 1849, the year of the great immigration, the yield increased to $25,000,000. In 1850 it became $40,000,000. In 1851 it extended to $60,000,000. In 1852 it became $63,000,000; and in 1853 the gold yield reached its maximum figure of $68,000,000. From 1854 to 1864 the yield varied from $52,000,000 to $63,000,000 of gold and silver. From 1865 to 1872 the annual yield has averaged $60,000,000, with no evidence of probable reduction, but with every prospect of increasing the amount, as we have better facilities and more labour for the working of the mines. The aggregate production is estimated at $1,380,700,000.

The intelligent observer who visits the mining regions of America will be surprised to find what a comparatively small area has been found to produce the precious metals. In the counties of El Dorado and Nevada it is only here and there miners' work is seen. The ravines that are worked, the mountains that are mined, and the ledges that show labour are vastly unfrequent as compared to the innumerable gulches, hills, mountains, and gravel banks that yield the precious ores. The mines are not the one hundredth part yet discovered, and of those now being worked they are scarcely prospected. Some idea may be formed of the prospective possibilities of the future by contemplating two of the mines of Nevada, upon the Comstock lode, the Belcher and the Crown Point.

The Belcher Mine was incorporated in June, 1863. It has produced from above the 800 ft. level from the year 1865 to the year 1870, 43,965 tons of ore, which yielded in bullion $1,696,835·43. The first bullion was produced in September, 1863, and from this "bonanza" dividends, amounting to $421,200 were paid to stockholders in the years 1864 and 1865. The following table shows the production of the mine from its organisation to September 1, 1873:—

1863 to 1866	Tons 31,725	..... Value	$1,474,269·33
1869	888	.....	18,313·17
1870	11,353	.....	204,252·93
1871 (last five months)	18,468	.....	1,199,134·87
1872	83,195	.....	4,794,559·10
1873 (eight months)	103,114	.....	7,260,637·62
Total	248,742	.....	$14,951,267·02

The ore-body of the Belcher Mine has produced in 25 months 204,777 tons, averaging $64·24 per ton, the gross yield of which was $13,251,122·43. Eighteen dividends have been paid, aggregating $74 per share, equal to $7,596,000. The mine expenses during the period, including new works, shaft, and incline, are something over $5,000,000. The proportion of gold and silver is represented by the following figures:—

Gold	$7,609,266·94
Silver	5,566,572·29
Assay grains	78,244·20

To show the increasing ratio of production, the Belcher Mine produced:—

For the last five months of 1871	$1,199,134·87
For the year 1872	4,794,559·10
For the first eight months of 1873	7,260,328·46
Total	$13,254,122·43

The Crown Point Mine shows the following production from the same "bonanza," for the three years ending May, 1873. Tons worked, 238,548; bullion produced, $10,418,599·80. Adding the yield of May, June, July, and August, 1873, to bring the account to Sept. 1, 1873, we have 279,975 tons worked:—

Bullion	$13,148,863·19
Dividends	6,540,000·00
Surplus	475,000·00
Expenses	6,155,863·19

The grand total production of these two splendid mines is over $26,000,000, having divided among their shareholders over $14,000,000 in net profits.

In April and May, 1873, before the water commenced falling in the Carson river, the production of the Belcher and Crown Point Mines was $4,869,298—equal to $81,000 per day. The last reports from the Belcher Mine continue to show wonderful prospects, indicating every ability to pay dividends for years, and yield as much or more in the future as in the past. The body of ore developed in Crown Point and Belcher, and to be developed, exceeds anything of the kind ever known on the Pacific Coast, and shows how lavishly Nature has scattered her wealth in our mountain ranges.

It is impossible to estimate the untold millions of wealth yet to be developed upon the Pacific Coast. In less than 30 years, from all sources, the mines have produced not less than $2,000,000,000 of gold and silver. From a single body of ore upon the Comstock vein nearly $27,000,000 have been taken out in a few months. Let science find the process—cheap and easy—to subdue rebellious ores, let machinery be improved and labourers multiplied upon the Coast, and it is impossible to forecast the splendid future that awaits America from this inexhaustible source of wealth.

FOREIGN MINES.

CAPE COPPER MINING COMPANY.—At a meeting of the directors, on Wednesday, it was resolved that a dividend of 20*s.* per share, free of income tax, be declared. The company have received despatches per Asiatic. Captain Tonkin writes very favourably on the present condition and prospects of the Ookiep Mine, and states:—"In some of the stopes we find the ore extending a considerable distance beyond what was formerly considered the boundary of the productive ground." Bill of lading is received for 430 tons of ore, per Juliet Daniel. The 487 tons of ore, ex Antonio Vinent, were sold on Tuesday by public ticketing, at an average of 16*s.* 5½*d.* per unit, realising approximately 13,300*l.*: 500 tons of ore and 10 tons of regulus have been put forward for sale by public ticketing on the 16th inst.

PONTGIBAUD SILVER-LEAD MINING AND SMELTING COMPANY.—At the meeting of shareholders, held on Nov. 28, the sum of 25 frs. per share was paid on account of the same on June 5, and the balance of 30 frs. per share will be paid in exchange for the 12 dividend coupon on and after Dec. 5. The payments made in England for such balance of dividend will, after allowing for French tax and exchange, be at the rate of 1*l.* 3*s.* per share, subject to deduction of income tax.

ST. JOHN DEL REY.—The directors have received, per Tiber, the following report, dated Morro Velho, Nov. 1:—

		Total depth.
Sinking in shafts, October:	A shaft..... 2 fms. 1 ft. 3 in.....	184 fms. 2 ft. 7 in.
	B shaft..... 6 fms. 0 ft. 10 in.....	191 fms. 3 ft. 8 in.
Total	8 fms. 2 ft. 1 in.	

We are at the same time opening out into the lode from shaft A, and propose commencing to reduce the ore therefrom in the stamps on Nov. 3.

DON PEDRO.—Oct. 30: Produce: Weighed to Oct. 31, 4710 oits.; estimate for the month, 6800 oits. The ore obtained, we regret to say, has not turned out so favourable as the samples in the early part of the month led us to expect, the mineral having lessened in value, but we are happy to state the samples are again improving. The line of gold in Canoa also became deranged, and failed to produce the usual rich work, but we are glad the change was only temporary. The line is again yielding about 4 lbs. of gold to the ton. The works in hand are progressing with the usual regularity, and the water being drawn from the mine amounts to 16 cubic feet a minute.—Stopes—Canoa: The lode and line of gold have proved to be very fluctuating. Fair strake work samples are being taken from the incline sinking in this lode towards the 30 cross-cut. Water plentiful.—No. 6 Shoot: We have commenced an incline in this lode to sink below the 25 fm. level; the lode is large, and a small deposit has been found rich enough to save for box-work.—No. 8 Shoot: The incline has reached the back of the 30 cross-cut; we shall continue this to get as near as possible to the horizon of the bottom of the cross cut, and as early as convenient we propose to drive a level from the same in the lode to drain it to that depth. Another incline is commenced about 9 fathoms north of the above for the purpose of drainage and opening stopes, &c.

ROSSA GRANDE.—Extract from letter, dated Oct. 28:—Water Supply: We are still retarded from carrying on operations to the extent desired, owing to an insufficient supply of surface water. Since I last wrote you we have had occasional showers of rain, but the water in the rego is still very low.—Mine: Bahu: We are forcing on the sinking of the sump shaft with all possible speed; the lode is still a little disordered, but I have every confidence in its becoming well defined again within a short distance. Some rich mineral has been extracted from the stopes in the back of the 28 east, where the lode is at present fully 4 ft. 6 in. wide. The various other points under operation in this mine continue without alteration of importance since my last.—Cachoeira: The slight increase of surface water we have had during the month has enabled us to make some progress towards forking the water in this mine. We have at present a very few hands employed in the back of the 10 east, and the lode, as mentioned in my last, is of a very bunchy nature, but of fair yield.

MINERAL HILL (Silver).—Mr. Oakes, superintendent, Oct. 10: The prospecting on the hill goes on without change to notice. The ore raised is as before—40 tons, of an average grade of 840 per ton.

ALMADA AND TIRITO.—Telegram from Mr. Clemes:—"$14,110 profit for the months of September and October"—equal to 2822*l.* sterling. Profit for the two months, after deducting London expenses, 2570*l.* These estimates of profit are given subject to the ores realising the amount of Mr. Clemes' valuations.

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka, Nevada:—"Hall, London—Week's run, $44,000; re-lining one furnace.—McGEE."

EBERHARDT AND AURORA.—A telegram announces that the new mill has started, and also that the mines are looking well.

MALPASO GOLD WASHING.—C. R. Clarke, Oct. 28: On the 23rd inst. we cleared up after running 561 hours, in which time we ran 22 nights, and as our night-work is all done by peons they wash much less dirt than is done during the day, still the result is better than any run heretofore, the run yielding 82000 (417*l.*). We got out 300 ozs. of amalgam—275 ozs. in the first 650 feet of sluice. We cleaned up this time clear through, and it will take us about five or six days to replace everything and start the machine again. During the run we washed away a piece of ground 100 ft. square, which would average from 20 to 30 ft. deep. As our cut is only 100 ft. wide we are 100 ft. nearer the high banks. I keep our sluice on its regular grade, and it now lies in an open cut in the tight gravel 14 ft. below the machine. I shall use this cut as a sluice, and run our dirt through it to the sluice for 200 or 300 ft. ahead before putting in any more sluice; by this means I save sluice, and grind or rub the gold before it reaches the quicksilver, so that it amalgamates more readily. I also save labour, as the gravel grinds down the cut and saves picking and shovelling. The tight gravel rises very fast, and I have every reason to believe that we shall have this rich gravel underlying long before we reach the high banks. Over ditch stands very well, but it requires constant watching. On Oct. 8 we stopped to add 40 ft. to lower end of sluice; on the 18th we added 40 ft. more to the lower end. We now have water, and if it continues I shall clean up again about Dec. 1.

RICA GOLD WASHING.—C. R. Clarke, Oct. 28: On the 19th some person turned on the water, which broke the ditch badly, and caused us the loss of four days' washing. The gravel continues about the same as last described: we are now washing from four to seven hours per day. I shall clean up about Nov. 5, and I will send you the result.

COLORADO TERRIBLE LODE.—The following extract is from a letter received from Professor Richardson, on the 1st inst. He says:—The Terrible Mine never looked so well as it does now; there is a course of ore in the bottom of the shaft from 6 to 9 in. wide, and a flookan full of fine strings of silver 12 in. thick: it is nearly vertical, and it is on the north wall. Should this hold down and onward to the west the lode will be worked cheaper, and I think make a larger quantity of ore per fathom. The assay of the above is over 600 ozs. The fifth level has been run in 590 ft. west from Discovery shaft, with a fine course of ore in sight the whole way. Particulars of the sale of shipments Nos. 34 and 35 are to hand this morning. CT. 34, 9 tons jigged ore, assay 310 ozs. silver, 33½ per cent. lead. CT. 35, 8 tons first-class, assay 504 ozs. silver, 48¼ per cent. lead; 1½ ton jigged ore, assay 267¾ ozs. silver, 74½ per cent. lead. Total value of the shipments, (say) 2137*l.* 15*s.* The 36th shipment (10 tons first-class) has arrived in Liverpool, per steamer Java. This assays 551 ozs. silver, and will realise about 1300*l.*

CLIFTON (Silver).—Extract from agent's advices, Nov. 11: I am now employing teams to haul to Collom's works another 50 tons; contract price at $3·50 per ton. Since my last to you I have succeeded in getting Prof. Hill to accept a few tons of our galena ores. I have sent him three loads (say 6 tons) on trial; if we can agree upon the price he will take all we produce. I have also sent him four loads (say 6 tons) of surface ore, and one load (say 1½ ton) second-class copper ore from Clifton Top Level. I shall get returns on the 15th from the lots of concentrated ores sold to the United States Smelting Company. We have ore still in the 100 ft. level, Clifton main shaft, and shall commence stoping from this point in a day or two. The mine is looking well in all the different workings.

CHICAGO (Silver).—W. S. Godbe, Nov. 15: I had counted on 840,000 as the profits for the first quarter from the time the furnace commenced running, and had the price of bullion remained as it was I would not be disappointed. Depreciation in the value of bullion will actually amount to about $8000 up to the present time, or nearly 810,000 for the full quarter. Mr. Davis, the new foreman, left for the mine this morning. Mr. Hampton is out of danger, but will be confined to his bed for weeks. He reports the mine looking finely at the bottom of the main incline and end of the left drift, and I shall bring with me photographs of all the company's improvements. I hope to be able to leave in two or three days.

— J. H. Latey: I have not much of moment to communicate for the past week, furnaces having been idle since the 6th, but will start again in a few days. No. 1 furnace emptied out, and proved to be in very good condition after the 66 days' run; it has been re-lined with Utah fire-brick, and will be run again. There was considerable "scale" in the boiler, which has been cleared out. Enclosed find clippings from local papers relative to the accident at the mine. I regret in this communication to state that Mr. Hampton will be badly disfigured for life, and it will not probably be known for a week or two whether he will lose the sight of one eye or not. The report from the mine is very favourable, and if present prospects continue we will have a higher percentage of lead. Since my last returns have been received from Omaha for the bullion shipped there the gross results are as follows:—$1641·02, $2066 97, $1812·25 for cars 16, 17, and 18; and for car 16, $1887·39. Three cart-loads of matte are here, and are being sampled. The first car of matte was shipped to New York, as already advised.

I.X.L. (Gold and Silver).—L. Chalmers, Nov. 10: We commenced pumping last Monday night, and I have now to report that the shaft is unwatered to within 19 ft. of the bottom, and that by to-morrow night I expect to have a dry shaft. Had I been able to work my two 60-gallon tubs as auxiliaries we should have had the water out within the week, but the new pump was too large to allow the tubs to pass. The new adit in the Ophir lode is in 66 ft., 15 ft. having been driven last week; we are now in a decomposed porphyry, close to the casing; this is a very important work, as independent of its immense advantage as an adit where we are likely to have a good deal of water to pump, it may prove a fertile source of ore supply. Next Monday, perhaps sooner, I hope to give you good news of the main lode at the 200. The old tunnels have produced about 25 tons of good ore. Seeing good ore on the floor of the lower tunnel I put two men to sink on it till water drove them out; the work done showed that the ore body widened as we got down, so that we shall have something to count on there when we get the north drift from the 200 under it; I got some very good ore out of the pit. I have also had men working near the old air shaft, where we have a large ledge, which I think will pay. In the upper tunnel I have opened out a shoot of ore that promises well.

EXCHEQUER (Gold and Silver).—L. Chalmers, Nov. 10: The north drift from the 100 is in 150 ft. from the cross-cut, 10 ft. having been run last week. One of the bucket-tenders being sick the stopemen and drivers had to tram the dirt, which reduced the run a little. Some very rich specimens came out of the stope, but I have not ore enough as yet for a good run at the mill; in size the lode is equally good, and will produce by-and-bye. I recommence sinking this week.

FRONTINO AND BOLIVIA (South America).—The directors have advices under date Oct. 12, accompanied by the usual accounts, and a remittance of gold valued at 883*l.*, the produce of the mine for September:—The following are the accounts for the month of September:—Cost: At Frontino and Bolivia Mines, and expenses in London and Medellin, 1089*l.* 19*s.* 8*d.*—Produce: 375½ ozs. gold dust from 1250 tons of mineral (average yield per ton, 6 dwts.), 883*l.*: loss, 206*l.* 19*s.* 8*d.* Mr. Franklin White says—"The prospects of the coming month are most favourable; and although, owing to the only available funds being what we can obtain from a mine which was pronounced hopeless, we are obliged to work on a small scale, yet we hope there will be permanent advantage in what is being done. If the company would forward us funds we could commence other paying operations more rapidly. At present it takes so long to get them into working order, as we cannot employ sufficient men. Next month the produce will be more and the cost less."—[It is a noticeable fact that notwithstanding the discouraging report of the late agent at Frontino, the Frontino Mines should have produced during the last month, under Mr. White's administration, a small profit, and what is even of more importance, that the workings should have been so carried on as to lay open and prepare the mines for future operations on a larger and more profitable scale. The ability which Mr. White has displayed in reference to the Frontino property leads the directors to hope that Mr. White's report on the Bolivia Mines, which will probably reach England by the end of the next month (December), will suggest some plan by which those mines may be worked much more advantageously than heretofore.]

UNITED MEXICAN.—Edward Hay, Oct. 27: Mine of Jesus Maria y José: The lode in the upper part of the vein in the workings to the south has improved a little, and the extraction of ore for the hacienda account has increased. Large numbers of tuscenes have gone to work, and the quantity of ore sold has increased weekly, as purchasers were giving good prices.—New Concern, Adit of San Cayetano, and Mine of Buenos Ayres: In the end west of the adit a strong reliz (wall of the lode), running north 52° west, has been traversed lately. Inside this wall a ramification of quartz rock has shown itself, and numerous close relizes cross it in various directions. In the cross-cut to the south we have traversed the lode, which is rather more than 13 feet broad, and widens towards the west. Although little can yet be said of the lode, on account of the narrowness of the cross-cut, still I think that the appearances on the western side are better than those on the east. As the rock on the other side of the lode was barren the advance of the cross-cut has been stopped. I intend carrying on the adit without deviation for the present, but if we do not shortly reach more favourable ground I will begin another small cross-cut to the south, or trend off gradually towards the lode, according to the circumstances.

BATTLE MOUNTAIN.—Captain Richards, Nov. 13: In the 113 feet drift, north of the Virgin Shaft, and north of Pearce's winze, I think the cross-course has had some influence in turning the drift to the left hand somewhat, and the ledge has been small during the past week, but is forming again now in its regular course, and I think will become well defined in a few feet driving. We have been waiting the arrival of some timber for timbering the new shaft from the 37 to the surface, which is now being got on with, as is also the making of the curs for the new shaft, whim, &c., very satisfactorily. In the stopes in the 78 fm. level, near the Virgin shaft, the lode is not so good, but will improve again shortly I think. In the back of the 37, near the Virgin shaft, some good ore is obtained. We shall commence a 145 drift north of Pearce's winze, to prove if the ore and native silver seen in the 118 feet drift improve in depth. In the stopes south of Termouth's rise, in back of 113 drift, nothing has been done during last week, the men being placed elsewhere.

ELDORADO (Gold, Nova Scotia).—Under dates Nov. 8 and 13, Mr. Sprague sends stock account, showing coals at mine to the value of nearly 700*l.*, and says the yield for October is—Retorted gold, 107 ozs. 10 dwts, value 662*l.*—Mine cost, 450*l.*: profit, 218*l.* Our stamps' list is as follows:—4 tons of quartz, from Mitchel vein, gave 14 dwts. 21 grs. retorted gold; 15 tons, from Crichton, 1 oz. 10 dwts.; 85 tons, from Plough, 105 ozs. 12 dwts.; 2½ tons, from Hogg, 16 dwts.; 3 tons, from Hattie, 4 ozs. 17 dwts. 10 grs.; 85½ tons, from Plough, 48 ozs. 18 dwts. 2 grs.; from 32 tons of tailings, 1 oz. 13 dwts. 12 grs.: from copper plates, 3 ozs. 8 dwts. 3 grs.: total, 195 tons of quartz, which gave 167 ozs. 10 dwts. We have lowered the plunger-pump to within 10 ft. of the bottom of the shaft, Plough vein, set in penthouse, &c., and are now sinking shaft. The quartz we shall stamp separately, to ascertain its value, as usual. Nine men are employed here. Two men driving tunnel north, with one smith and two enginemen. The rock presents a favourable appearance in the shaft sinking on the Major Norton vein: it is still broken up, mixed with quartz and mundic, which is considered a favourable indication; we hope to get the solid rock very soon. The 44 tons of quartz was from the old workings; it shows the richness of some parts of the gold streak: 100 tons before gave 31 ozs.; since then (October) 85 tons gave 105 ozs. 12 dwts., and the last clean-up (85½ tons) 48 ozs. 18 dwts. 2 grs. I mentioned what we had done to the tailings in my last, and will send the barrel as you direct. The sinking of the shaft is going on regularly. Severe frost in the early part of the week, to-day a very heavy rain storm. The loss of mercury since I have been here is 10¾ dwts. per ton of quartz stamped; recovered in washing the tailings, 2½ dwts. per ton.

WEST CANADA.—Nov. 15: The stopes now being worked are without alteration since the date of the last report, and stand as follows:—The stope in the bottom of the 56, west of Palmer's shaft, is yielding 3 tons per fathom. The stope in the back of the same level, east of the shaft, will yield 3 tons per fathom. These are in the Huron Copper Bay Mine. The stope in the bottom of the 35, east of Bray's shaft, in the Wellington Mine, yields 2¾ tons per fathom.

BENSBERG.—J. W. Hoffman, Nov. 29: We have this week again commenced clearing fresh ground at the west end of the open cast, from which we shall get a considerable quantity of wash ore and carbonate. The level west from the open-cast has been driven through the ore-bearing ground, and has been stopped, as we shall catch the ore at a greater depth with our 20 metre level in a short time. The boring tools have arrived in Cologne, and will be here in a day or two, when we shall at once commence boring. Production of carbonate for the week, 10 tons; delivered, 30 tons.

MENZENBERG.—R. K. Roskilley, Nov. 29: Dickens's Engine Shaft: We took up the lode in this shaft sinking below the 23 fm. level again to-day; the copper-bearing part of it continues much the same as when last reported on, and still yields some beautiful grey and yellow copper ore. We have not as yet sunk through it. There is no other change throughout the mine worthy of notice.

[For remainder of Foreign Mines, see to-day's Journal.]

CHARLES BALL AND CO.,

21, NEW BRIDGE STREET, BLACKFRIARS, LONDON.

ROCK DRILLS.

DIFFERENT SYSTEMS.

THE ANTI-CONCUSSION DRILL.—This machine is specially adapted for driving levels, adits, or tunnels. It works without concussion, and therefore does not wear out. Has driven as much as 53 yards of drift in one month, where hand labour could only progress 8 yards in the same time. Forty-four of these machines are at work in a single colliery. Price £105.

THE EXCELSIOR.—This machine is the latest out; it is self-acting, self-feeding, self-stopping. It has fewer parts than any other drills, and its simplicity is remarkable. It is specially adapted for sinking and vertical work. Price £85.

THE QUARRIER.—Self-acting and self-feeding, very light and handy, suited for general work, and for quarry work, especially on account of its very small dimensions and lightness. Price £60 to £80.

THE HAND DRILL—Hand drill for soft material. Price £20 to £24.

DRILLS of other systems are also in stock, and can be supplied, if desired.

Each of these Drills is a different Patent, constructed on a separate and distinct principle.

REGISTERED TRADE MARK.

AIR COMPRESSORS.

DRY SYSTEM.—Cheap and simple—six sizes.

WET SYSTEM.—This plan of compressing air is so perfect that the volume of the air compressed is equal to 96 per cent. of the volume of the cylinders. It is recommended whenever the work is of a permanent nature, or likely to be protracted. Driven by steam direct—nine sizes. By water power or straps—six sizes.

BOILERS.

SMALL BOILERS, for working Rock Drills, from 4 to 12-horse power generally in stock,

ANY LARGER SIZE TO ORDER.

PUMPS, STONE BREAKERS, WINDING ENGINES, &c.

Messrs. CHARLES BALL and Co., in consequence of their long experience in Rock Drilling, both in England and on the Continent, are prepared to advise professionally as to the best methods for driving and sinking according to nature of rock and local circumstances.

Should other ROCK DRILLS or MINING MACHINERY be successfully brought out by practical Engineers, Messrs. C. BALL and Co. are prepared, after having had the invention thoroughly tested, to enter into arrangements with the Inventors for the INTRODUCTION of such MACHINES in this Country and Abroad.

Progress obtained by CHARLES BALL and Co.'s DRILLS at the Collieries of Ronchamp:—

By hand - - - - - - - - - - - - 8 yards per month.

By Charles Ball and Co.'s Machines - - - - 53 yards per month, or 6½ times as fast.

M'TEAR AND CO.'S CIRCULAR ROOFING FELT,

FOR
GREAT ECONOMY
AND
CLEAR WIDE SPACE.

For particulars, estimates, and plans, address,—

M'TEAR & CO.,
ST. BENET CHAMBERS,
FENCHURCH STREET,
LONDON, E.C.;
54, PORTLAND STREET,
MANCHESTER;
OR
CORPORATION STREET,
BELFAST.

The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheeted with 1½ in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 80s. per square, according to span, size, and situation.

Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.

INODOROUS FELT for lining damp walls and under floor cloths.

DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.

PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

Wholesale buyers and exporters allowed liberal discounts.

PATENT ROOFING VARNISH, in boxes from 3 gallons to any quantity required 8d. per gallon.

THE DON LUBRICATING OIL

IS 40 PER CENT. CHEAPER THAN ORDINARY KINDS,

AND QUITE AS GOOD AND DURABLE.

It is absolutely free from the very common defect of gumming.

Mr. HEWLETT, of the Wigan Coal and Iron Company, says:—"*I have used it for two years, and find it to answer exceedingly well for lubricating purposes.*"

Trials may be made at our risk.

AGENTS WANTED AT HOME AND ABROAD.

DUNCAN BROTHERS,
2. BLOMFIELD STREET, LONDON, E.C.

BENNETTS' SAFETY FUSE WORKS,

ROSKEAR, CAMBORNE, CORNWALL.

BLASTING FUSE FOR MINING AND ENGINEERING PURPOSES,

Suitable for wet or dry ground, and effective in Tropical or Polar Climates.

W. BENNETTS, having had many years experience as chief engineer with Messrs. Bickford, Smith, and Co., is now enabled to offer Fuses of every variety of his own manufacture, of best quality, and at moderate prices.

Price Lists and Sample Cards may be had on application at the above address.

LONDON OFFICE,—H. HUGHES, ESQ., 85, GRACECHURCH STREET

Third edition—enlarged 8vo.—illustrated cover.

HOW TO MAKE MONEY BY PATENTS.

By CHARLES BARLOW.

Free by post for Fourteen Stamps.

BARLOW and Co., 23, Southampton-buildings, Chancery-lane, London, W.C.

GUIDE TO INVESTMENTS.

Published monthly. Post free.

SPARGO'S "GUIDE TO INVESTMENTS" affords information (ample and correct) of all the best-paying investments. Capitalists and men of business should consult the "Guide" for reliable and valuable intelligence. THOMAS SPARGO,

Gresham House, Old Broad-street, E.C.

Established Twenty-six Years, Fifteen at present address.

MINES AND MINING.

Now in the Press, and will shortly be issued.

SPARGO'S ANNUAL STATISTICS AND OBSERVATIONS ON THE MINES OF CORNWALL, DEVON, AND WALES.

The work will contain particulars of all the important mines in the counties referred to, and will be illustrated by maps and sections of the various districts, forming a complete Guide to Mining Investors.

Price 3s. 6d.; by post 3s. 8d.

To secure an early copy subscribers are requested to forward their application as early as possible. Only a limited number will be issued.

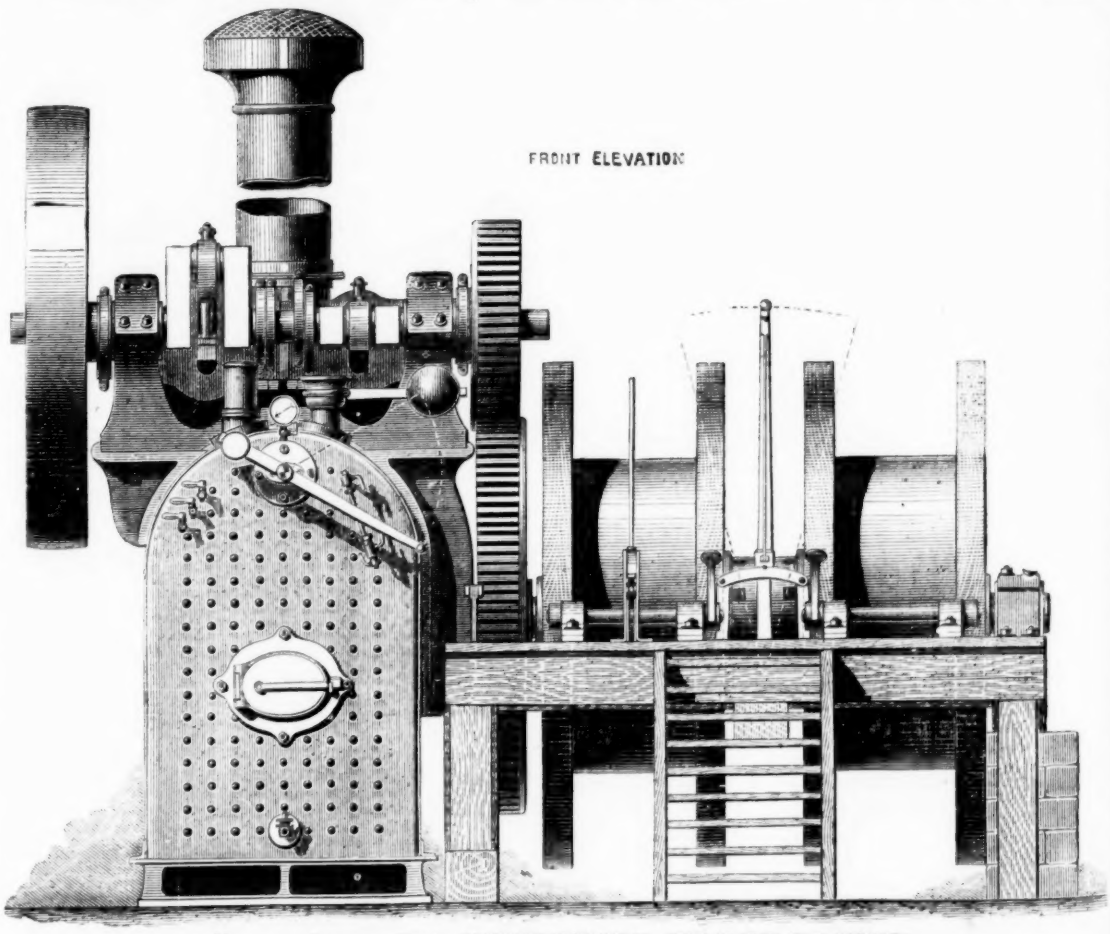
THE NEWCASTLE DAILY CHRONICLE,

(ESTABLISHED 1764.)

THE DAILY CHRONICLE AND NORTHERN COUNTIES ADVERTISER

Offices, Westgate-road, Newcastle-upon-Tyne; 50, Howard-street, North Shields; 195, High-street, Sunderland.

THE ROBEY MINING ENGINE.



FRONT ELEVATION

FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

ROBEY AND COMPANY, LIMITED,

PERSEVERANCE IRONWORKS, LINCOLN.

ALSO OF PATENT PORTABLE

HAULING & WINDING ENGINE

WITH

PATENT DRUM WINDLASSES,

FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—

Haulage along inclined drifts is easily and cheaply effected;

The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required

It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;

It can be very quickly removed (being self-propelling), and fixed in any desired position.

Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

THOMAS WARDEN & SON,

IRON, STEEL, AND GENERAL MERCHANTS,

LIONEL STREET, BIRMINGHAM,

Manufacturers of Anvils, Vices, Hammers, Bellows, Tue Irons, Hydraulic and Screw Jacks, Crabs, Cranes, Spades, Shovels, Picks, Arms and Boxes, Axles, Springs, Hurdles and Fencing, Screw Bolts, Washers, Hames, Chains, Files, Nails, &c., &c.

SECOND-HAND RAILS, AND EVERY DESCRIPTION OF RAILWAY, COLLIERY, AND CONTRACTORS' PLANT ALWAYS ON HAND.

TWO GRAND MEDALS for PROGRESS

AT THE

VIENNA EXHIBITION

AWARDED TO

THE "BURLEIGH"

ROCK DRILLING AND AIR COMPRESSING MACHINERY.

ROCK DRILL ON TUNNELLING CARRIAGE.

ALSO

Two Silver Medals, Highland and Agricultural Society of Scotland, 1873.

Three Silver Medals, Manchester and Liverpool Agricultural Society, 1873.

References to Users in all parts of the World.

Adapted for Mining, Quarrying, Tunnelling, Shaft-Sinking, &c.

NEW ILLUSTRATED CATALOGUES, PRICE LISTS, and ESTIMATES, and every Information, POST FREE, On application to the Patentees and Sole Proprietors,

THOMAS BROWN & CO.
96, Newgate Street, London.

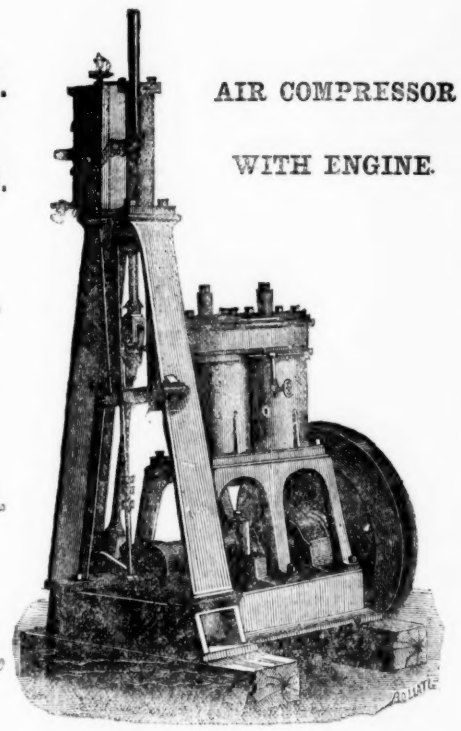
Sole Agents—

WILSON, McLAY & CO., 2, Talbot Court, LONDON, and
87, St. Vincent Street, Glasgow.

Sole Makers—

CRAVEN BROTHERS, MANCHESTER.

AIR COMPRESSOR WITH ENGINE.



Adapted for Driving Rock Drills, Coal-Cutting, Pumping, and Underground Machinery, or where the Motive Power has to be conveyed long distances.

The Drills (in 5 Sizes) can be Mounted on any Description of Carriage or Support, according to the Nature of the Work.

"BURLEIGH" MACHINE VERSUS HAND DRILLING.

* *Extract from Paper read before the British Association at Bradford, 1873, on Brain's System of Mining and Shafting Sinking at the Drybrook Iron Mines, Forest of Dean, using the "Burleigh" Rock Drilling and Air Compressing Machinery:*

(Shaft 10 ft. Diameter.)

COST OF SHAFT BY HAND

During a Fortnight.

Sinkers, twelve, 12 days each, at 5s. 6d.	£39 12 0
Water Fillers, three, 12 days each, at 3s. 6d.	6 6 0
Blasting powder	1 2 0
Total	£47 0 0

Depth Sunk 3 yards—Cost per yard . . £15 13s. 4d

COST OF SHAFT BY MACHINE

During a Fortnight.

Sinkers, three, 12 days each, at 5s. 9d.	£10 7 0
Labourers, six, 12 days each, at 3s. 6d.	12 12 0
Engine Stokers, two, 12 days each, at 2s. 6d.	3 0 0
Dynamite, 60 lbs., at 2s.	6 0 0
Electric Fuses (Brain's) 20 per day, at say 6d. each	6 0 0
Coal for Air Compressing Engine, 12 tons small, at 10s.	6 0 0
Oil for engines	0 5 0
Total	£44 4 0

Depth Sunk 5 yards—Cost per yard . . £8 16s. 9d.

THE ABOVE STATEMENT REPRESENTS WHAT IS NOW BEING DONE AT THE ABOVE MINE.

ADDITIONAL TESTIMONY.

(COPY.) *The Weardale Iron and Coal Company, viâ Darlington, Sept. 6th,* 1873.

Messrs. T. BROWN & Co., 96, Newgate Street, London, E.C.

DEAR SIRS,—I have much pleasure in informing you that the Rock Drill and High-pressure Boiler, with which you supplied us, are both working extremely well.

I am, yours truly,

(For the Weardale Iron and Coal Company, Limited),
J. R. CRONE.

(COPY.) *Crossfield Iron Ore Works, Crossfield Moor Row, viâ Carnforth, Sept. 8th,* 1873.

DEAR SIRS,—In reply to yours of 2nd inst., I am sorry I have not time to go into the comparative results of hand labour in sinking with that of the work done by your "Burleigh Drill." All I can say is, that for the last few months it has been giving me every satisfaction, and there is a marked difference in the progress of our sinking operations.

I am, yours truly,

JOHN MAIN.

* The Paper can be had upon application to THOMAS BROWN & CO., 96, Newgate Street, London, E.C.

BY ROYAL LETTERS PATENT.

H. R. MARSDEN, BLAKE MACHINE

ONLY MAKER OF THE WELL-KNOWN

ORE CRUSHERS, WITH THE NEW PATENT CUBING JAW.

Has received 30 First-class Gold and Silver Medals.

750 NOW IN USE.

ALSO,

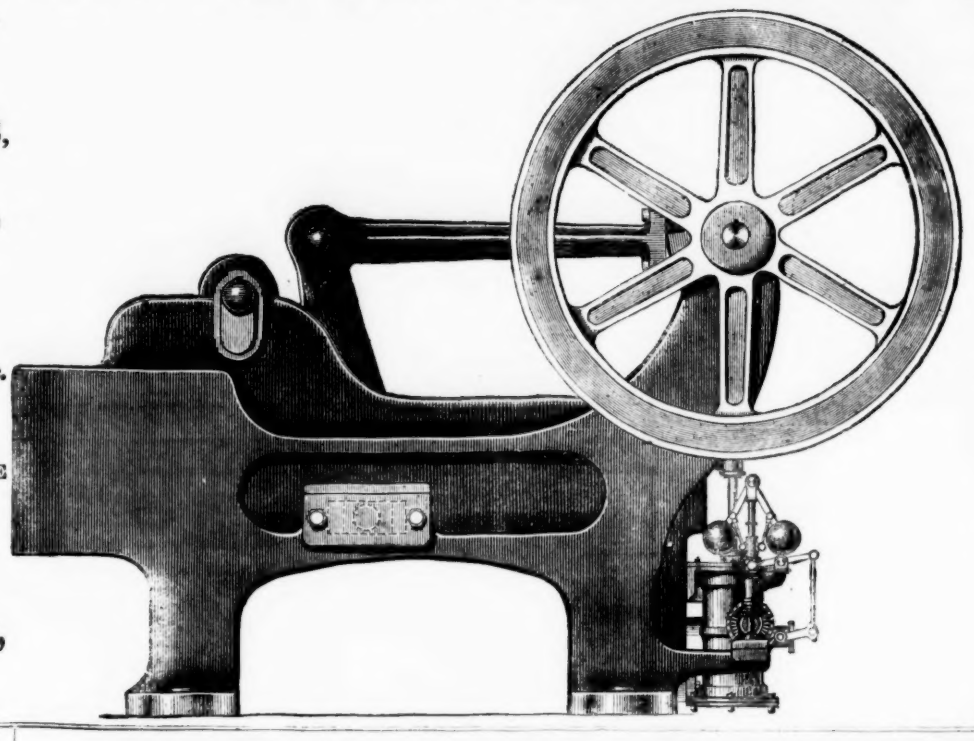
NEW Patent EMERY CRUSHERS,
CEMENT CRUSHERS,
MACHINES for making GRAVEL
AND
ROAD METAL.

COPROLITE CRUSHERS,
Small Handpower Machines for Crushing Samples, &c.

SECURES FIRST-CLASS PRIZE MEDALS WHEREVER EXHIBITED.

ARE IN USE IN ALL PARTS OF THE WORLD. IMMENSE SAVING OF LABOUR.

Users write—"It is a fascination." "A wonder." "Your Ore Crusher is all that we could desire."



REFERENCES TO ALL PARTS OF THE WORLD.

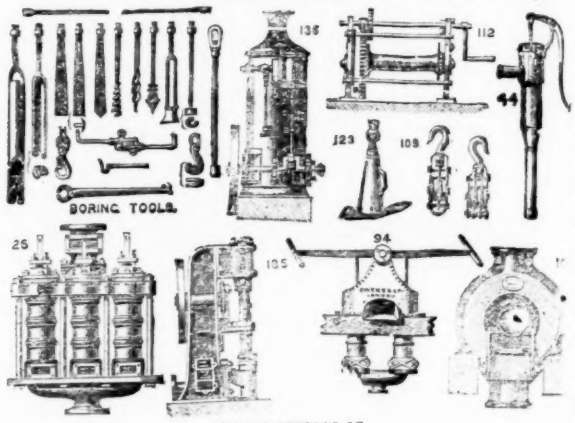
For illustrated catalogues, circulars, and testimonials, apply to—

H. R. MARSDEN, Soho Foundry,
LEEDS,
ONLY MAKER IN THE UNITED KINGDOM.

S. OWENS AND CO.,

Hydraulic and General Engineers,

WHITEFRIARSSTREET, FLEETSTREET, LONDON
AND AT
195, BUCHANAN STREET, GLASGOW (W. HUME, AGENT).



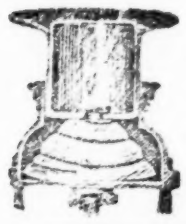
MANUFACTURERS OF

BORING TOOLS, for testing ground for Minerals. Bridge foundations, Artesian Wells, &c., to any depth.
No. 26.—Treble Barrel and other Deep Well Pumps.
No. 136.—Vertical and other Portable Steam Engines.
No. 185.—Horizontal and Vertical Steam Pumping Engines.
No. 112.—Single and Double-purchase Crab Winches.
No. 108.—Pulley Blocks of all sizes.
No. 123.—Bottle and other Lifting Jacks.
No. 94.—Double-barrel Pumps, for Mine or Quarry use.
No. 44.—Portable Wrought-iron Pumps, ditto ditto
No. 102.—Bernay's Patent Centrifugal Pumps, of all sizes.

ALSO EVERY OTHER DESCRIPTION OF
HYDRAULIC AND GENERAL MACHINERY,
COMPRISING
TURBINES, WATER WHEELS, WIND ENGINES, THE HYDRAULIC RAM, FIRE ENGINES, &c.

Catalogues and Estimates on application.

THOMAS TURTON AND SONS,



MANUFACTURERS OF
CAST STEEL for PUNCHES, TAPS, and DIES
TURNING TOOLS, CHISELS, &c.
CAST STEEL PISTON RODS, CRANK PINS, CONNECTING RODS, STRAIGHT and CRANK AXLES, SHAFTS and
FORGINGS of EVERY DESCRIPTION.

DOUBLE SHEAR STEEL
BLISTER STEEL,
SPRING STEEL,
GERMAN STEEL,

FILES MARKED T. TURTON
EDGE TOOLS MARKED WM. GREAVES & SON

Locomotive Engine, Railway Carriage and Wagon Springs and Buffers.

SHEAF WORKS AND SPRING WORKS, SHEFFIELD.

LONDON WAREHOUSE, 35, QUEEN STREET, CANNON STREET, CITY, E.C.
Where the largest stock of steel, files, tools, &c., may be selected from.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM

(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857,

The largest and most widely circulated papers in Monmouthshire and South Wales.
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the second edition at Five P.M. On Friday, the "Telegram" is combined with the "South Wales Weekly Gazette," and advertisements ordered for not less than six consecutive insertions will be inserted at an uniform charge in both papers.
P. O. O. and cheques payable to Henry Russell Evans, 14, Commercial-street Newport, Monmouthshire.

MINING PROSPECTUSES AND ANNOUNCEMENTS OF PUBLIC COMPANIES should be inserted in the BARNSTAPLE TIMES, published every Tuesday, and in the DEVON POST, published every Saturday, as these papers circulate largely throughout Devon and Cornwall, where many thousands of investors reside. Legal and Public Companies' advertisements, 6d. a line each insertion; Trade and Auctions, 4d. a line; Wanteds, &c., 20 words, 1s.
Published by J. B. JONES, Boutport-street, Barnstaple, Devon to whom all orders, by post or telegraph, should be sent.

COAL-CUTTING MACHINERY.

W. and S. FIRTH undertake to CUT, economically, the hardest CANNEL, ANTHRACITE, SHALE, or ORDINARY COAL, ANY DEPTH, UP TO FIVE FEET.

Apply,— **16, YORK PLACE, LEEDS.**

COAL-CUTTING BY MACHINERY.

WILLIAM BAIRD & CO.'S

COAL-CUTTING MACHINES

[GLEDHILL'S PATENT IMPROVED].

Messrs. BAIRD have now made arrangements for the manufacture and supply of their PATENT COAL-CUTTING MACHINES, a number of which may be seen in successful operation in their mines at GARTSHERRIE, and elsewhere. In these mines the Machines are undercutting a "face" of coal of from 300 to 400 feet, to a depth of from 2 feet 9 inches to 3 feet 6 inches; this is effected in a "shift" of from eight to ten hours. If necessary, the undercutting can be increased to 4 feet.

All information on the subject given, and orders booked, by the SOLE AGENTS—

FERGUSON & REID, GLASGOW.

THE DIAMOND DRILL.

PROSPECTING OR TRIAL BORING FOR MINERALS.

The DIAMOND ROCK BORING COMPANY (LIMITED) is PREPARED to UNDERTAKE CONTRACTS at FIXED RATES for PROSPECTING or BORING for MINERALS of all kinds. Great speed is attained; work that formerly took years is done in the same number of months, and sample cores are brought up, showing the nature of the strata passed through, and enabling the minerals obtained to be analysed.
The company has a number of MACHINES in SUCCESSFUL OPERATION in different parts of ENGLAND, and the terms, with particulars, will be supplied upon application to—

THE SECRETARY, DIAMOND ROCK BORING COMPANY, LIMITED,
2. WESTMINSTER CHAMBERS. LONDON. S.W

Established 1844.

WHITLEY PARTNERS, LIMITED,

RAILWAY WORKS, LEEDS,

ENGINEERS, FOUNDERS, AND LICENSEES.

MANUFACTURERS OF IMPROVED STEAM ENGINES, BOILERS, PUMPS, &c.

MAKERS, by Special Machinery, of PATENTED MECHANICAL INVENTIONS, comprising numerous Labour-saving Appliances and Economisers of Fuel and Motive Power.

CONTRACTORS TO THE EUROPEAN AND COLONIAL GOVERNMENTS AND CORPORATIONS.
MERCHANTS AND SHIPPERS OF MACHINERY, METALS, AND HARDWARE.

AWARDED

THE FIRST PRIZE MEDAL AT THE EXPOSITION UNIVERSELLE, PARIS, 1867, "For Improved Construction, Excellence of Material, and Superior Workmanship."
TWO GRAND GOLD MEDALS AT THE MOSCOW INTERNATIONAL EXHIBITION, 1872. THE FIRST PRIZE MEDALS AT LEEDS AND LYONS IN 1858, 1868, AND 1872.
ALSO, THE MEDAL FOR MERIT AT THE VIENNA EXHIBITION OF 1873, "For Excellence in Material and Workmanship, the Employment of Improved Tools and Machinery, and the Opening of New Markets."

REDUCTION IN PRICE OF PEET'S VALVES, CONSEQUENT UPON LARGELY INCREASED SALES.
ILLUSTRATED CATALOGUES AND ESTIMATES ON APPLICATION.
Correspondence conducted in English, German, and French.

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*December 6, 1873.*